Traveling Shelvador Display Aids Sales Of Illinois Dealer

SPRINGFIELD, Ill. — Bruce Co., Crosley dealer here, which sold approximately 200 Crosley electric refrigerators during 1934, followed a merchandising plan which included several novel ideas.

Features of the merchandising program outlined by Mr. Bruce are as follows:

Two trucks travel through the streets of Springfield and adjacent territory all the time, each truck equipped with a "Shelvador."

In the downtown section, the company has a "Tri-Shelvador" on display at the City Water, Light and Power Dept. in the city hall.

Approximately 40,000 people pass this display twice each month, estimates Mr. Bruce.

A refrigerator window display is in the store at all times. All models are kept on display at the store to aid in closing the prospect when he or she comes to the store to study the different models and select the one best suited to his or her needs, ability to pay, etc. Displays are placed from time to time in the theater lobbies.

Refrigerators are sold on the 15-cents-a-day plan, if desired. The check-back system of calling on refrigerator purchasers is used for the purpose of making sure the customer is using the refrigerator right and is getting satisfaction, and also for securing new prospects.

The Bruce company advertises in the newspapers and has a program over the local broadcasting station. The firm ties in with the Crosley national advertising programs in magazines, trade papers, and over WLW.

Twenty-four hour service for refrigerators is maintained by the company.

Washington Utility Offers Low-Priced Appliances

SEATTLE—That utilities can compete with government-sponsored agencies in offering electric appliances at low prices is indicated in the copy employed in the advertising campaign of the Puget Sound Power & Light Co.

"Teaser" advertisements used in newspapers and outdoor bulletins did not reveal details of the plan, but announced new low prices and terms as long as six years.

A few days later, the complete plan was disclosed through the same media. Radio announcements were also made on special programs from five stations in the company's territory. Folders for customers and display posters and window streamers for dealers were used.

In the current merchandising event, ranges are offered at $1.95 down and the same amount per month. Where normal wiring is necessary to install a range, the charge is 40 cents more on the down payment and 40 cents more per month.

Employees of the company, other than merchandise salesmen, are offered bonuses of $5 on water heaters, and $2.50 on range sales; and $2.50 for water heaters and $1.50 for ranges which replace other equipment.

A special cooperative plan was offered tradesmen and dealers whereby they can make earnings on each sale of water heaters or electric ranges.

The range offered is the new-design Hotpoint with 16-in. oven and automatic control. The automatic water heater is made by Edison General Electric Appliance Co. to the specifications of the power company's engineers, who developed and perfected it for Pacific Northwest operating conditions.

Baltimore Utility to Sell For Landers, Frary & Clark

BALTIMORE—Appointment of the Baltimore Light Co., as distributor in this territory for the Universal electric refrigerator, manufactured by Landers, Frary & Clark, has been announced.

Will The Dealers

who are conscious of the value of Artificial Food Display and who want to know how to obtain a full Refrigerator Display, for less than $5.00, inquire from their source of refrigerator supply, or by writing the

CINCINNATI DOLL CO.
Artificial Food Department
311-313 E. 12th St., Cincinnati, Ohio

Supervisor

C. H. GUY
New supervisor of utility sales for Westinghouse refrigerators.

Kansas City Code on Trade-Ins Revised

(*Concluded from Page 1, Column 2*)

Service Co., Anderson Furniture Co., Auto Radio Co., Harley Beets Sales Co., Blue Seal Home Appliance Co., Broadway Hardware Co., Bunting Hardware Co., Butler Music Co., Glenn Carter Co., Davidson Furniture Co., Duff & Repp Furniture Co., Elder & Carey Electric Co.

Electrical Appliance Shop, Emery Bird Thayer Dry Goods Co., Falconer Furniture Co., Folk Sales Co., Glanville Furniture Co., Goode Hardware Co., Gorman Furniture Co., Grandview Furniture Co., Great Western Stove Co., Harris-Goar Co., Home Appliance Co., Prince Howard Furniture Co., Independence Hardware Co.

Jenkins Music Co., Kansas City Power & Light Co., Katz Drug Co., Kraft Bros. Hardware, Kuluva Department Store, Lane Electric Co., R. L. Lewis, Mace-Reynolds, Mace-Ryer Co., Manning & Miles, Maxwell Electric Co., McIndoo & Wrigley, Midwest Electric Appliances, Inc., Missouri Electric Co., Missouri Public Service Co.

Morrow Electric Co., Nederman Music Corp., North-Mehornay Furniture Co., Palmer & Blue Electric Co., George B. Peck Dry Goods Co., Peerless Radio & Electric Co., Burton J. Pierce Co., Rainen Furniture Co., Regina Electric Co., Rice Electric Co., Robertson Sales Co., Rockhill Radio Co.

Sause Electric Co. Schanze Furniture Co., Sherer Bros., Star Furniture Co., Stewart Bros. Electric Co., Strasser Hardware Co., Thor Service Electric Shop, Tucker Furniture Co., VanCleave Furniture Co., Vanden Boom's Furniture Co., Walls Electric Co., Rudolph Wurlitzer Co., Wyandotte Furniture Co., Yost Furniture Co., L. E. Zeiger.

Gibson Sales Increase 111% in January

GREENVILLE, Mich. — Officials of the Gibson Electric Refrigerator Corp. here recently reported an increase of 111 per cent in January sales this year as against the corresponding period of 1934, and an increase of 400 per cent in unfilled orders.

New distributors for Gibson electric refrigerators, recently appointed, include:

The M & M Co., Cleveland, distributor for Columbus; H. R. Curtiss Co., for San Francisco; Otis Hidden Co., for Louisville, Ky.; Wm. H. Metz Co., for Des Moines, Iowa; Wright & Wilhelmy, Omaha, Nebr.

New Gibson dealers are as follows:

Eastern Outfitting Co., May Co., Barker Bros., the Lincoln Acceptance Corp., all of Los Angeles; Reliable Furniture Co., Akron, Ohio; Alert Pipe & Supply Co., Bay City, Mich.; People's Outfitting Co., Kirk Furniture Co., and the Colonial Furniture Co., all of Indianapolis.

Syncronode Eliminator Features Crosley Set

CINCINNATI — Feature of the new 1935 Crosley "Roamio" automobile radio is the new syncronode "B" eliminator, which eliminates the use of a separate rectifier tube or motor generator, and does away with the need for "B" batteries.

Toledo Department Store Takes on G-E Line

TOLEDO — The Lion Department Store here, which for years handled Frigidaire refrigerators exclusively, added a line of General Electric models March 1.

75 Utility Men Hear Westinghouse Plans

MANSFIELD — Seventy-five executives of the Middle West Utilities Co., Chicago, were told the story of Westinghouse's sales promotion and advertising plans for 1935 at a recent visit to the Westinghouse Electric & Mfg. Co.'s plant here as guests of the merchandising division.

Westinghouse executives who took part in the program included A. E. Allen, vice president; R. E. Imhoff, sales manager; P. Y. Danley manager, refrigeration department; R. C. Cosgrove, manager, household refrigeration sales; Reese Mills, manager, range and water heater department; I. W. Clark, kitchen planning service; C. G. Hillier, manager, water heater sales; J. D. Kelly, manager, range sales; L. L. Shawber, manager, laundry equipment and vacuum cleaner sales; J. F. O'Brien, advertising manager, Westinghouse Lamp Co., New York City; and L. A. S. Wood, special representative of the lighting division, Cleveland.

The utilities executive also inspected the Westinghouse plant and the Home of Tomorrow institute.

Pratt Completes New Warehouse

SAN FRANCISCO—The California Refrigerator Co. has just completed an addition to its warehouse and store room to house refrigerators, copper tubing, refrigerant gases, and refrigerator and air-conditioning parts, reports Clarence F. Pratt, president.

The company recently received a carload of Starr-Freeze units which had been shipped by water over the Mississippi river, the Gulf of Mexico, the Panama Canal, and the Pacific ocean.

2 New Crosley Dealers Appointed by Apollo

NEWARK—Lauter Humana Co. of this city, and Lauter Co., Paterson, N. J., will handle Crosley Shelvador electric refrigerators, reports Fred Goldberg, treasurer Apollo Distributing Co., Crosley distributor here.

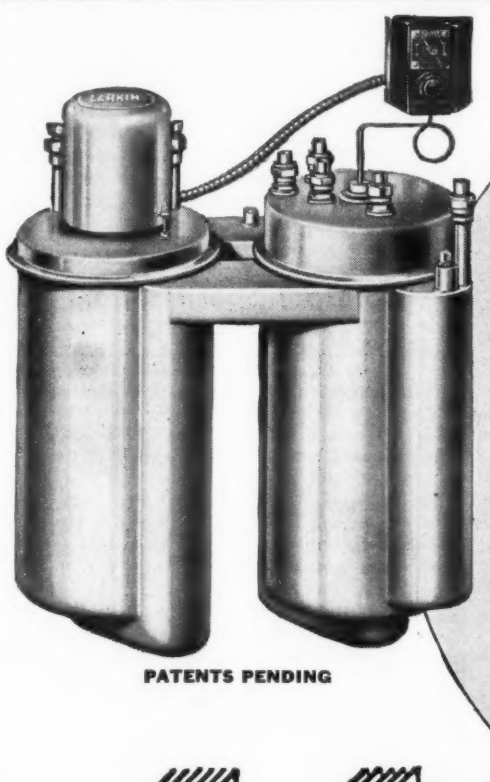
Mr. Goldberg states that, up to the present time, 135 new dealers have signed to handle 1935 Crosley Shelvador refrigerators in Apollo's territory.

Clothing Problem Is Very Important To This Kelvinator Man

HONOLULU — When George F. Murray of Kelvinator Corp. makes a swing of the area comprising his territory he travels a distance equivalent to that required to circle the globe. His territory is Hawaii, the Phillippines, Japan, China, Manchukuo, Hong Kong, French Indo-China, Siam, the Strait Settlements, Java, Sumatra, and Borneo.

Mr. Murray left here recently for the Detroit Kelvinator plant before going back to Tokyo via Europe.

"I have to carry so many kinds of clothing with me," he explains. "For instance, I hit Hong Kong where it is quite hot and one has to wear 'whites.' But I go from there down to Shanghai, and in that city one needs woolen suits and a heavy overcoat at this time of year. I come on over to Hawaii and, at this season, one needs medium weight clothing. I go on to San Francisco and I have to unpack my light topcoat. From there I move on to Detroit and then I have to drag out the heavy overcoat again."

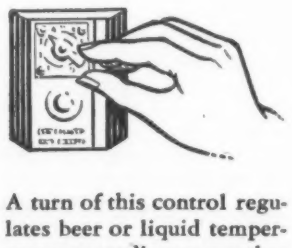


PATENTS PENDING

1 MINUTE
after Beer Coils are Steam or Chemically Cleaned 38° Beer can be served with the

LARKIN

DUAL-CONTROL
LIQUID COOLER



A turn of this control regulates beer or liquid temperatures according to weather demands. No need to make any compressor adjustment.

● When you recommend a beer cooler choose one that has the most features—the one easiest to sell—the LARKIN. The ease with which beer coils can be kept in a clean sanitary condition appeals at once to a bar tender. When steam cleaning the beer coils the refrigerating machine and the refrigerating coil side of the LARKIN cooler are not disturbed. Chemical cleaning may be used, if desired.

Think of the added advantages of these features: Dual-Control—brine temperature controls compressor and beer temperature controls brine circulation. Reserve Cold-Hold sufficient to cool 3 gallons of beer 10° without starting compressor. Any LARKIN cooler can be enlarged up to 5-beers by adding additional beer coils. Two temperature valves are not needed when the cooler is used in multiple installations. With Cold Control, temperature of beer can be regulated according to weather without resetting the refrigeration machine unit. The LARKIN is the only beer cooler that does not disturb and thus preserves the brewed-in flavor. For any refrigerant.

WRITE FOR DESCRIPTIVE FOLDER
It gives full details of the sales features and advantages of the LARKIN and why your trade will prefer it.

For cooling beer, water, root beer, carbonated water, orange juice, milk, etc. For saloons, taverns, hotels, restaurants and factories.

LARKIN REFRIGERATING CORPORATION

102 Fifth Ave. NEW YORK, N. Y. — ATLANTA — 325 S. California Ave. CHICAGO, ILL.

Cold Control—Foam Control

THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

WRITTEN TO BE READ ON ARRIVAL

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G-E Puts Pedal Control on New Water Coolers

10 Models Covering All Applications in New Line

CLEVELAND — General Electric's 1935 line of water coolers, made public last week by W. E. Landmesser, manager of the company's commercial refrigeration department, includes 10 models, covering the range of water cooler service from bottle coolers to heavy duty, freeze-proof, and heat-proof industrial units.

With its new line of coolers G-E introduces foot pedal control. The faucet is operated by a foot pedal, located at the lower left corner of the cooler. On the bottle water cooler the pedal permits the user to have one hand free while using the other to hold the cup. In drinking from the pressure cooler hand operation is eliminated entirely.

Appearance of the coolers has been enhanced by modern styling. New sanitary features have been embodied. The bottle water cooler, model BM-21, and the pressure cooler, RM-21, have contamination-proof spigots. A chrome-plated guard conceals and protects the faucet—prevents contamination by contact with soiled hands and shields it from dust.

All coolers are equipped with splash-proof bubbler basin or drain basin. Cabinets are all-steel, rust-proofed, and finished in smooth bronze.

The cooling unit in all models consists of a cylindrical water-tight chamber of corrosion-resistant metal. Inside the chamber is a continuous silver-filled, seamless copper refrigerant coil supported by spring-type spacers. Water in the cooling chamber is cooled by direct contact with the coil. All joints in the refrigerant line are outside the cooling chamber to eliminate the possibility of refrigerant leakage into water.

G-E's new heat interchanger, located between the condensing unit and cooling unit in the refrigerant lines, is said to increase the efficiency.

A twin-cylinder, reciprocating-type, belt-driven G-E condensing unit is mounted in the bottom of the cabinet on rubber cushions to minimize vibration. Models BM-21, RM-21, and RM-51 are equipped with units powered by a ⅛-hp. motor; model RM-61, a ¼-hp. motor. Model RM-71 is equipped with a water-cooled condensing unit and ¼-hp. motor.

A carafe filler, or glass filler, is available for the RM-51, 61, and 71 models. Models BM-21 and RM-21 have a refrigerated compartment constructed of welded steel with inside finished in acid-resisting porcelain.

The capacity of the RM-21 and RM-51 coolers with 65° F. tap water, is 8 gallons per hour, 80° F. room; model RM-61, under same conditions, 20.4 gallons per hour. The RM-71, a water-cooled model, has a capacity, with 70° F. tap water, of 17.6 gallons per hour. The general dimensions of these models are: 42-15/16 in. high, 19⅞ in. deep, and 18⅞ in. wide.

G-E industrial coolers are made in

(*Concluded on Page 2, Column 1*)

58 Conditioners Sold during '34 In Pittsburgh

By T. T. Quinn

PITTSBURGH — Air conditioning made rapid strides forward in this city during 1934, the 58 installations reported going 23 over the combined total of installations in all years previous to that time.

Applications of air-conditioning equipment to office, home, and industrial use totaled 17 in 1933, and 18 in the years prior to 1933, according to figures compiled by the Duquesne Light Co. in the territory served by that utility.

The most striking increase in the

(*Concluded on Page 13, Column 1*)

Philadelphia Show Will Open April 8

PHILADELPHIA—The seventh annual Electric Refrigeration Show, sponsored by the Electrical Association of Philadelphia, will be held here April 8 to 13, George R. Conover, managing director of the association, has announced.

The exhibition will occupy two floors in the Edison Building. Refrigerators to be displayed will include Atwater-Kent, General Electric, Westinghouse, Stewart-Warner, Kelvinator, Leonard, Frigidaire, Grunow, Crosley, Norge, Gibson, Electrolux, and Coldspot.

Concurrently with the Philadelphia show, the association will also conduct similar exhibitions in Chester and Coatesville, Pa.

Prof. Kratz to Address Joint Meeting of Detroit Groups

DETROIT—Prof. Alonzo P. Kratz of the University of Illinois will be the principal speaker at the joint dinner meeting of the Detroit sections of the American Society of Heating & Ventilating Engineers (A.S.H.V.E.) and the American Society of Refrigerating Engineers (A.S.R.E.) at 6:30 p. m. Monday, April 1, at the Wardell hotel. The meeting will be devoted to "Summer Cooling."

Prof. Kratz is recognized as one of the country's foremost authorities on air conditioning, through his experiments with various types of equipment in the research residence at Illinois' Engineering Experiment Station in Urbana, Ill.

John Howatt, national president of the A.S.H.V.E., and George Helmrich of the Detroit Edison Co. will be other speakers on the program.

Wieboldt Chain, Chicago, To Sell Crosleys

CHICAGO—The Wieboldt chain of department stores will sell a complete line of Crosley Shelvadors in all five stores, reports C. S. Tay, manager of the Crosley Distributing Corp. here. James Parker will manage the refrigeration department.

Lipman Builds Self-Contained Floor Type Unit

Air-Conditioning Manual For Distributors Completed

BELOIT, Wis.—Featured in the 1935 line of Lipman air conditioners, manufactured by General Refrigeration Corp. here, is a self-contained floor-type unit conditioner with a cooling capacity of approximately five tons of refrigeration.

Supplementing this self-contained model are suspended-type conditioners and duct-type coolers.

To help sell this air-conditioning equipment Lipman engineers have just completed a comprehensive air conditioning sales and engineering manual, for the guidance of distributors handling Lipman air-conditioning equipment.

This manual defines and explains air conditioning terminology, describes what air conditioning does, outlines methods of analyzing problems, and has chapters on air conditioning controls, duct design data, grilles and registers, layouts and applications, tables, charts, and engineering data.

The Lipman self-contained conditioner is equipped with a 5-hp., four cylinder Lipman compressor, located in the base of the unit. Freon is the refrigerant used. The condensing unit

(*Concluded on Page 19, Column 3*)

Case Industry Elects New Code Authority

CHICAGO—Seven new members of the commercial refrigeration industry were elected to the Commercial Refrigerator Code Authority at the annual meeting of the industry held here recently.

Members are as follows: H. C. Ahrens, chairman, The C. Schmidt Co., Cincinnati; W. B. McMillan, vice-chairman, Hussmann-Ligonier Co., St. Louis; C. V. Hill, treasurer, C. V. Hill & Co., Trenton, N. J.; W. C. Cruse, Sr., Cruse Refrigerator Co., Louisville, Ky.; R. H. Friedrich, Ed. Friedrich Co., San Antonio, Tex.; J. I. Holcomb, Holcomb & Hoke Mfg. Co., Indianapolis; Karl Weber, Weber Showcase & Fixture Co., Los Angeles.

The new code authority established a new code fee rate of 1/20 of 1 per cent of net sales, which represents a 75 per cent reduction in the former rate of 1/5 of 1 per cent.

Jansen Joins Electrolux Sales Promotion Staff

EVANSVILLE, Ind. — Adolph Jansen, Jr., formerly advertising and sales promotion manager of General Accessories, Inc., New York City, has joined the sales promotion department of Electrolux refrigerator sales division of Servel, Inc.

He will handle dealer promotion as assistant to Hank Boyle, Servel sales promotion manager.

Radio Offered by Leonard in Coin Meter Plan

DETROIT — Leonard Refrigerator Co. has developed and is introducing a "Radio Len-O-Meter Plan" through which Leonard outlets are given an exclusive combination of a kitchen "recipe radio" and coin meter to aid in their merchandising efforts.

J. J. O'Neil, manager of the Leonard department store division, developed the new radio and meter combination.

Constructed so that the coin which keeps the refrigerator operating also provides current for the radio, the new combination is said to be tamper proof. The radio is finished in white, and almost entirely conceals the

(*Concluded on Page 11, Column 1*)

Frigidaire Setup in Detroit Announced

DETROIT — Refrigeration Sales Corp., has been appointed Frigidaire commercial representative for the Detroit metropolitan area, R. F. Callaway, manager of the Detroit district of Frigidaire Corp., has announced.

John R. Miller is president of the new organization, and Walter H. De Mattia is secretary and treasurer.

Both are experienced in the refrigeration business, Mr. Miller having been sales manager of the commercial department of the Detroit district, and a former Frigidaire district engineer, and Mr. DeMattia having been with Frigidaire for eight years as assistant service manager and district engineer in the Detroit office.

Offices of the new organization will be at 4584 Maybury Grand Ave., where Frigidaire district offices are located.

Norge Dealer in TVA Area Town of 9,600 Sells 83 Units in 2 1/2 Months

CORINTH, Miss.—An unusual early season sales record has been established by Corinth Radio Co., Norge dealer in this city of 9,600 population.

From Jan. 1 through March 10, a total of 83 Norge refrigerators were sold in and around Corinth by Corinth Radio Co. salesmen under the direction of G. F. Mitchell, proprietor of the store. No small TVA models were sold during the period, and nothing extra in the way of price concession or premiums was offered prospective buyers.

Twenty-three refrigerators were sold during January as the result of a sales campaign during that month. A carload of Norges was ordered for delivery in February, and 38 more were sold before the carload arrived here, a number of these for immediate delivery.

Mr. Mitchell credits the cooperation of the A C. E. Power Co., local utility, the TVA, and the EH&FA with a large share in the success.

Salesmen for the Corinth Radio Co. are H. G. Peery, Corinth Banker, George Stein, Fred Galyean, Frank Crouch, Tom Harwell, Clifton Mills, and R. M. Mitchell.

Two Groups Vie To Impose Code On Distributors

Electrical Wholesalers and Radio Wholesalers In NRA Battle

By Phil B. Redeker

WASHINGTON, D. C.—Distributors of household electric refrigerators, who have gone along very happily since the inception of the NRA without any code, have now unwittingly assumed the role of the prize in a tug of war between the National Electrical Wholesalers Association and the Radio Wholesalers Association, with the NRA acting as a not-too-interested umpire.

Following approval of its code last August, the National Electrical Wholesalers Association just "assumed" that distributors of household refrigerators came under its code.

Subsequently it sent out notices of assessment for administration of their code, causing refrigeration distributors some uneasiness and bewilderment. (see "Letters" column on editorial page of March 13 issue.)

On Feb. 28 of this year, however, the deputy administrator in charge of the Electrical Wholesale Code informed the Electrical Wholesale Code Authority that pending a public hearing the Code Authority would not administer the Electrical Wholesale Code for refrigeration distributors.

Shortly before this time, in answer to an inquiry from ELECTRIC REFRIGERATION NEWS, Assistant Deputy Administrator E. O. Mather had declared that refrigeration distributors were governed by the *general* wholesaling code only, the original and very broadly worded document drawn up for wholesalers in all fields.

In the meantime, during the past six weeks, the Radio Wholesalers Association has launched an intensive campaign to arouse sentiment in favor of a so-called "Specialty Code" to include refrigeration and electrical appliance specialty distributors.

The Radio Wholesalers, led by Howard Erstrom, chairman of the Radio Wholesale Code Authority, have based their campaign for a "Specialty Code" (which would be a revision of the Radio Wholesalers Code) on the fact that the Electrical Wholesalers Association is not representative of distributors of electric refrigerators and other major electrical appliances, and use the membership list of the N.E.W.A. to prove their point.

E. Donald Tolles, managing director of the National Electric Wholesalers Association, retorts to this by declaring that distributors of refrigerators are eligible for membership in the N.E.W.A.

In a recent bulletin Mr. Tolles requests N.E.W.A. members to encourage the affiliation of refrigeration distributors with them, and sums up the situation as follows:

"1—N.E.W.A. for its members and acting on the authority of many non-members presented a Code for the Electrical Wholesale Trade, which was approved Aug. 13, 1934.

"2.—An electrical wholesaler is de-

(*Concluded on Page 2, Column 5*)

Dick Cooper's Guests Resolve to Put the Middle West on a Water-Cooled Basis

General Electric distributors from the central district and their key men looked over the new line of G-E water coolers last week in Chicago, and found them pleasing. (1) "Yes, these new coolers will cover any type of application," says W. M. Timmerman (left), G-E engineer. "Then I know where I can place 50 of them in Dubuque," replies M. B. Mendalhall of Crescent Electric Supply Co., Davenport, Iowa, while L. G. Kohlman, commercial manager for R. Cooper, Jr., Chicago, doubles him mentally, but says nothing. (2) Tony Barger of Bard-Barger, Inc., Columbus-Cincinnati, Lou Miller, sales manager of Electrical Housekeeping, Inc., Cleveland, and John Hawley of Caswell, Inc., Detroit, grin, each in anticipation of how far his distributorship will be ahead of the other two in water cooler sales when the year's up. (3) Ralph Cameron (hands clasped), assistant sales manager of G-E's specialty appliance sales department, and Carl Ballus of Electrical Housekeeping, Inc., smile as A. F. "Squire" Head, Indianapolis distributor, evaluates the line's possibilities. (4) Don Keller of Midwest Electric Appliances, Kansas City, balances peas on his knife for the benefit of Ed Schaefer of E. H. Schaefer Corp., Milwaukee, A. E. Leider, and G. O. Hall of G-E's production and distribution department.

SPECIFICATIONS OF 200 AIR CONDITIONING UNITS IN THIS ISSUE

Foot Pedal Operation & Other Refinements Characterize G-E Water Cooler Line

(Concluded from Page 1, Column 1)

two general styles. Models KM-71 and KM-73 have single bubblers and models KM-72 and KM-74, double bubblers. Model KM-71 and KM72 are built for usual industrial application, while KM-73 and KM-74 have heavily insulated cabinets for protection against freezing weather when installed out-of-doors.

Heavy-duty industrial coolers are equipped with a motor heat-removing device. A strip heater is provided for the freeze-proof coolers. They are designed to provide properly tempered drinking water in the hottest of steel mills or in the coldest of mill yards. Cabinets are all-steel, rust proofed—also dust proof so they may be *used* in extremely dusty locations.

The use of the CMF-4W ¾ hp. water cooled unit gives the necessary capacity.

With inlet water temperature of 60° F. the new industrial coolers have a capacity of 57 gallons per hour, cooling to 50° water at bubbler. They have a reserve storage capacity of 10 gallons.

District Meetings Held

General Electric's new line of water coolers was unveiled to the company's selling organization at a series of district meetings held in Chicago, New York City, Atlanta, and Dallas.

Attended by G-E distributor principals, commercial managers, and water cooler specialists, the meetings were devoted to detailed presentations of the various models, their features and applications; and to outlining sales and promotional activities.

At the New York City meeting, T. K. Quinn, vice president of General Electric, and P. B. Zimmerman, manager of the company's specialty appliance sales department, spoke on sales opportunities afforded by the new 1935 cooler line and the contributions—including foot-pedal control—General Electric has made to the water cooler industry.

Paul A. Hunker, G-E water cooler specialist, presented the 10 water cooler models—two bottle water coolers, four pressure coolers, and four heavy-duty industrial coolers.

Landmesser Ill

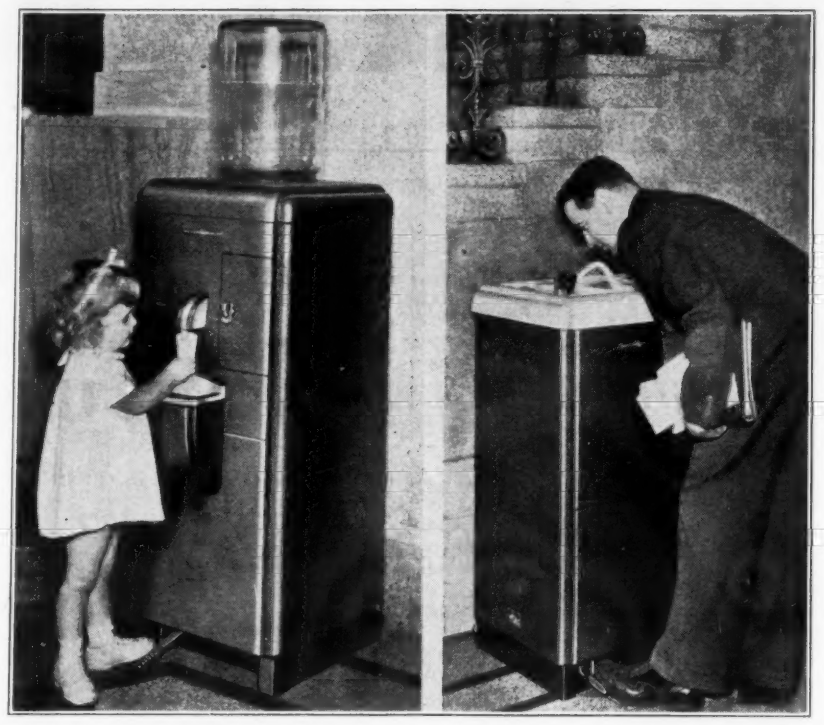
Walter Landmesser, manager of G-E's commercial refrigeration division, was unable to attend the meetings because of illness. He sent messages to the conferences from his home predicting that G-E water cooler sales in 1935 undoubtedly would establish an all-time record.

"If the green light ever was showing in the water cooler business it is now," he said.

Other speakers at the meetings from G-E's specialty appliance sales department, Cleveland, were A. M. Sweeney, sales manager; Ralph Cameron, assistant to Sweeney; Norman Ronning, in charge of production and distribution; and Jean De Jen, manager, campaign division.

Luncheon menus were worked out in calories and water content. Rex Cole, New York City distributor, presided at the luncheon held during the New York City meeting; Distributor R. Cooper, Jr., at the Chicago meeting; Distributor W. D. Alexander at the Atlanta meeting; and Glenn Wasson, head of Electric Household Appliances, Inc., at the Dallas meeting. Rex Cole's Mountaineers, radio broadcasters, headed the entertainment program at the New York City conference.

Use of Foot Pedal Grows



Little Sister on the left finds it easy to draw off a drink of water using the foot pedal on G-E's 1935 water coolers, while the book-laden student at right gets a drink even though both arms are full of knowledge.

New Gas-Electric Range Introduced by Standard

TOLEDO — The Standard Electric Stove Co. recently introduced a new range, Model 1445G, with an electric oven and four gas surface burners. The oven is automatic and controlled by a timer.

Wholesalers Tighten Code Provisions on Cash Discounts

WASHINGTON, D. C.—The National Industrial Recovery Board has approved an amendment to Article IV, section 8, of the electrical wholesale code, relating to cash discounts which members of the trade may offer to customers. The provision reads:

"Section 8. It shall be an unfair trade practice for a member of the trade to grant or offer to grant to a customer a discount for cash at a percentage greater than the precentage of discount for cash received by such member of the trade on the same merchandise, or to allow or offer to allow extra discounts for anticipation of payment, or to allow or offer to allow a discount for cash on accounts remaining unpaid after the tenth of the calendar month following date of shipment, or to grant or offer to grant any discount for cash where payment is made by warrant, note or trade acceptance."

Addition of the words "offer to grant" make it a violation of the code for any member of the trade to offer to a customer a discount for cash not in accordance with this provision, the Authority explains.

Two Groups Fight To Put Distributors Under Their Code

(Concluded from Page 1, Column 5)

fined in the Code as one who buys and sells some or all of the following electrical apparatus—appliances, materials, and supplies.

"3.—In submitting a report to President Roosevelt, General Johnson stated that N.E.W.A. was truly representative of the Electrical Wholesale Trade.

"4.—In September, 1934, the Code Authority for the Electrical Wholesale Trade specifically enumerated electrical domestic refrigerators, among others, as electrical appliances and so advised N.R.A.

"5.—Requests of electric refrigerator distributors for Blue Eagles and Labor provisions directed to N.R.A. were sent to N.R.A. to the Electrical Wholesale Code Authority. The Code Authority, complying with N.R.A.'s requests, has furnished Blue Eagles and labor posters, with assigned numbers, to upward of 100 such refrigerator distributors.

"6.—Early this year refrigerator distributors in the New York Metropolitan District, with approval of N.R.A., were granted a special Refrigeration Commission to administer the Electrical Wholesale Code in the New York area. The Code Authority authorized similar Commissions in other trade centers or the addition of refrigerator distributors to existing Code Commissions.

"7.—As 'members of the trade' refrigerator distributors were assessed by the Code Authority on Feb. 11, 1935.

"8.—On Feb. 28 the deputy administrator in charge of the Electrical Wholesale Code informed the Electrical Wholesale Code Authority that pending a public hearing the Code Authority will not administer the Electrical Wholesale Code for refrigeration distributors.

"9.—The date of the public hearing has not been set."

Inquiries made among electric refrigerator distributors indicate that they haven't much interest in the battle between the groups which are trying to place them under a code.

Hickman Heads G-E Store Operation In Joplin

JOPLIN, Mo.—Dick Hickman, formerly of Sell & Sons, General Electric dealers for Pittsburg, Kan., is the new manager of the G-E department of the Ramsay Dry Goods Co. here.

H. C. Doss, now sales promotion manager for Midwest Electric Appliances, Inc., Kansas City, formerly managed Ramsey's G-E department.

No let-up...No let down when you sell WILLIAMS ICE-O-MATIC

NO dead seasons—no rubber profits—when you sell Williams Ice-O-Matic electric refrigeration. Household and commercial lines assure all year business. Williams traditional finest materials and workmanship permit profits to stay with you.

Price right—profit right—with the great new Williams Ice-O-Matic household refrigerators—you can sell a lion's share of the market. Then throughout the year you have a paying commercial refrigeration business because Williams Ice-O-Matic equipment, engineered to the job, fills ANY commercial need at a low price, quicker sold, longer in profit.

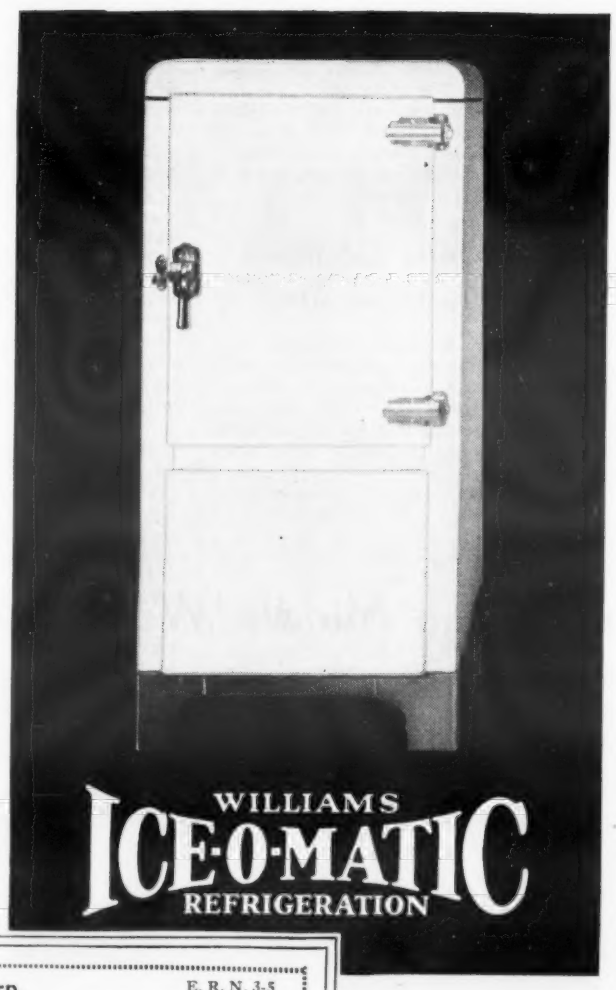
No limit to the installations on which you can quote—grocers, delicatessens, butchers, restaurants, florists, hospitals, institutions—even motor trucks where cooling is required.

Sell electric or gasoline-powered compressors. Sell a complete line of milk cooling equipment. Sell air conditioning products, too—Williams simple and superior Oil-O-Matic—with Williams performance and profit.

No better time than now to get in back of you this world's greatest concern specializing in the *control of temperature.* More than 75 millions of dollars have been invested in Williams products just from the household field alone.

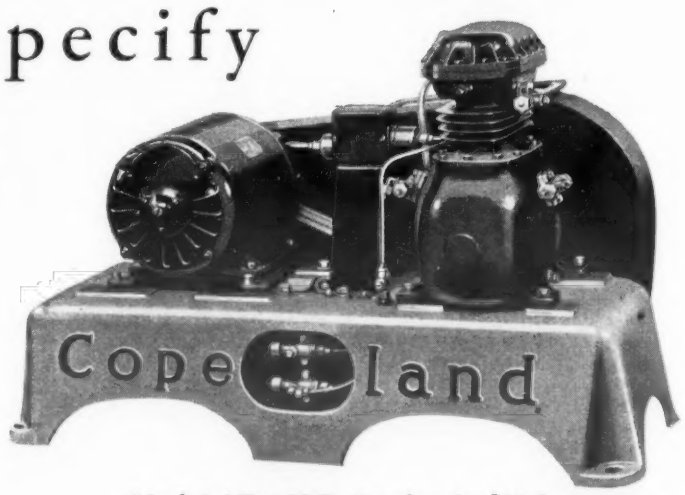
Look into the whole story. Your letter or telegram will bring full details of the Ice-O-Matic distributor or dealer franchise. Or paste coupon on a postal card. Send it today.

Ice-O-Matic Refrigeration Division
WILLIAMS OIL-O-MATIC HEATING CORPORATION
Bloomington, Illinois



Williams Oil-O-Matic Heating Corp. E. R. N. 3-5
Ice-O-Matic Division, Bloomington, Ill.
Please send me full details of the 1935 Ice-O-Matic line and franchise.
Name.....
Address.....
City.....*State*.....
Present Business.....

Specify



Model AZ 5 H.P. Condensing Unit
(Capacity 7000 lbs. at 35 lbs. Back Pressure)

FOR AIR CONDITIONING

These sturdy units are being widely used in Air Conditioning installations, with decided satisfaction. There is a definite reason for the preference being shown for Copeland Condensing Units. In a phrase it is: "They stand up".

Air-conditioning engineers find that, by combining several Copeland Condensing Units in multiple, they secure a flexibility in connection with variable loads which makes for extreme economy of operation.

Write for details of our distributing franchise covering our complete line of household and commercial.

COPELAND REFRIGERATION CORP., DETROIT, MICH.
Main Office and Factory: Holden Ave. at Lincoln

Copeland
DEPENDABLE *ELECTRIC* REFRIGERATION

WHAT BECAME OF THE *first* THREE MILLION?

9,000,000 electric refrigerators have been sold. Less than 6,000,000 are in use in homes today. What has become of the other 3,000,000?

G-E has built and sold nearly 2,000,000 with sealed-in-steel mechanisms and almost 100% of these are still serving original owners.

IN electric refrigerators performance year after year is more important to you and to your customers than all other sales features combined. Let's look at the record . . .

Approximately 9,000,000 electric refrigerators have been sold since the first one was made. It is generally admitted that there are less than 6,000,000 in use in homes today. General Electric has made and sold nearly 2,000,000. Figures taken from an impartial survey conducted by R. L. Polk & Co. in key cities from coast to coast show that 97% of the G-E refrigerators in use 5 years are still giving satisfactory service in homes of the original owners. These figures do not include G-E refrigerators still giving satisfactory service but which have been disposed of by their original owners.

No other refrigerator can match the General Electric's record for dependable performance at low cost year after year. The "ageless" G-E sealed-in-steel mechanism is the ONE outstanding feature in refrigeration today. When all is said and done, it's PERFORMANCE that sells refrigerators and shows the greatest net profits to both seller and buyer. Write or wire for details of the General Electric franchise. General Electric Co., Specialty Appliance Sales Dept., Sect. DF32, Nela Park, Cleveland, O.

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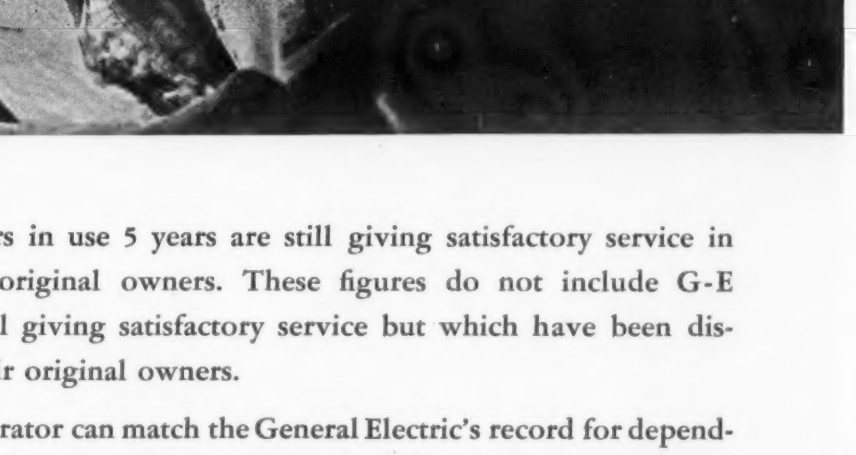
THE MECHANISM THAT DEFIES TIME

Now in all 3 types of refrigerators.. Monitor Top, Flatop, Liftop



GENERAL ELECTRIC

ALL-STEEL REFRIGERATORS

PERSONALITIES

By George F. Taubeneck

Joe and Jim

It isn't often that you hear employes and laborers refer to the president and chairman of the board of their corporation by their first names.

"The boss" and "the old man" are frequently heard in smaller organizations. In the bigger concerns the top men aren't even identities—employes say, "the front office," or "upstairs," or "the brass hats." Occasionally real familiarity is demonstrated by the use of initials, like "J.C."

At Stewart-Warner, nonetheless, it's "Joe" and "Jim" when employes speak of, *or to,* President JOSEPH E. OTIS and Chairman of the Board JAMES S. KNOWLSON.

When the democratic Mr. Otis walks through his plant, one hears on every side such salutations as "Hi, Joe," or "Hey, Joe, c'm'ere oncet and looka this."

One shouldn't infer that Messrs. Otis and Knowlson run around in shirtsleeves and overalls. They have the prosperous, substantial appearance, air, and manner of the financier type of executive.

When they talk, they give plenty of evidence of a close grasp of the situation in the industries they serve. On Knowlson's desk you will see a flock of graphs, charts, and tabulations—he's a bear on figures, and they give him great comfort.

Executives of the first water, these men haven't let the idea of their importance get them down. The point is that these two gentlemen are very *human.*

Stewart-Warner Is IN Refrigeration

Our interview with "Joe and Jim" last Friday wasn't much of a success from a reporting standpoint, for the simple reason that they kept the reporter so busy answering questions that he had small opportunity to ask any of his own.

One thing we did find out, though. All rumors to the contrary notwithstanding, Stewart-Warner is definitely IN the refrigeration business.

There was a time last fall when that statement couldn't have been made. Stewart-Warner's first two years in refrigeration did not result in entries on the profits side of the ledger. And so banking influences attempted to lop off the refrigeration operation.

A little further study, however, convinced Stewart-Warner executives that they had obtained a toe-hold in the refrigeration business at comparatively low cost. Many other manufacturers, they found out, had lost considerably more in their first years.

So Stewart-Warner decided to go into refrigeration with both feet. They hired JOHN DITZELL, one of the bang-uppiest sales managers in the business, and told him to go out and turn on the heat. John is out on the West Coast doing that very thing at the moment this is being written.

Some 400 completed refrigerators are coming off the assembly line at Stewart-Warner every day now. Cabinets are being supplied by Rex.

GUS TREFFEISEN, able and well-informed assistant to CHARLES D'OLIVE took us across the street to see the lines, to watch the refrigerators "on test," and to see the new float valve assembly which is the particular pride of the Stewart-Warner factory this year.

It all looked very much as if Stewart-Warner meant business.

* * *

Missing Wives

Three executives ranking high in the refrigeration industry were temporary bachelors in Chicago last week. It must have been a good week for wives to visit their mothers, or go where the climate is a bit balmier.

Ennyhoo, this coincidence kept the editor out of any possible mischief in Chicago, for each of these three suddenly lonely gentlemen were available as dinner-and-afterward partners.

Almost forgot to mention them: CHARLES D'OLIVE, Stewart-Warner home appliances mogul; DUANE WANAMAKER, advertising and sales promotion manager of General Household Utilities; and W. PAUL JONES, vice president of Fairbanks-Morse Home Appliances, Inc.

Between the three, this kolyum saw quite a bit of Chicago.

* * *

One of the Jones Boys

Jones we have long considered one of the brightest young men in the industry. His phenomenally *early* start as a responsible executive has been followed by years of distinguished ideazation, planning, and execution for Servel.

But our evening together last week offered convincing proof that we can't call W. PAUL JONES a "bright young man" any longer. He is still brilliant; but today his sobriety, strong sense of responsibility, ability to evaluate his rich experience, and sound judgment have made him a substantial business man, seasoned and matured.

When the new Fairbanks-Morse vice president dropped into his recently acquired position he was already in motion, like the old-time Rockne backfields.

He believes he has the situation pretty well doped out, knows just what he wants to do, and is proceeding to do it.

* * *

How to Live

Never do we spend an evening with CHARLES D'OLIVE of Stewart-Warner without thinking: "Here is a man who knows how to live."

His quiet, unruffled, easy mode of progress enables him to lead one of the most gracefully successful lives we have ever had the privilege of observing at close range.

At home, teaching his fine young son by subtle indirection, or showing his admirable collection of prints, etchings, and photographs; with a gun in his hand on the skeet-shooting range; across a table or beside a bar in a quietly elegant "spot;" in a taxicab—anywhere you find him, his mellow, philosophical conversation is a delight and an inspiration. And never a *strain.*

He should live a long time.

Yet, unlike most men of this physical type, Mr. D'Olive has crowded an unusual range of experiences and excitement, and a wide variety of interests, into his comparatively small number of years.

Note to Chicago merchants: Mr. D'Olive is a sucker for anything made of blue glass.

* * *

Showman at Home

Now that WALTER DAILY is in the agency business, to DUANE WANAMAKER'S slim shoulders probably should fall the industry's mantle of showmanship.

His "baby" advertisements for Grunow refrigerators this season are a case in point. Also his limelighting of the hitherto little-known home-and-fireside poet, ANNE CAMPBELL.

So we might have known what to expect when, after jaunting for umpteen miles all around Chicago in a taxicab, we arrived at his home.

Floors at different levels, golden-glinted walls, electrical potted flowers, a subtly show-windowed Grunow radio, unexpected arrangements of furniture, odd-spotting of books, and withal, COMFORT—it was an unusual home.

Like most advertising men, Mr. Wanamaker has a wide acquaintance among the related realms of radio, stage, and screen, as is attested by the autographed photographs in his basement den.

One close friend of Duane's, however, was a surprise to us—"Automatic" JACK MANDERS of the Chicago Bears backfield. Manders, you know, is the greatest place-kicker of all time, as well as one of the best blockers. Bring him over to Detroit some day, Mr. Wanamaker, and we'll arrange for him to meet—*socially,* not on the field—some of our best Lions.

Contest Replies

In "A Housewife Looks at Contests," published in a recent issue of *Advertising & Selling,* Caroline Gale Harder compliments the Kelvinator Corp. on "following through" to keep the interest and good will of participants in contests.

"In the last few months," writes Miss Harder, "I have been increasingly impressed that the advertisers have singularly failed to follow through and keep the interest and good will of the thousands of people they have spent money to reach. The few who are the recipients of prizes are counterbalanced by great numbers who may be disappointed, or have no particular feeling of loyalty to the products advertised.

"A single exception to this impression," she asserts, "was my reaction to the letter sent out by the Kelvinator Company, at the close of their Christmas contest. As I look back in my mind over numerous contests, this is the first time I have been deemed sufficiently important, as a sales prospect, to receive a personal follow-up letter that definitely tries to hold my good will and keep me interested in the product advertised.

"Many of the companies," she continued, "have acknowledged my entries with brief postal card messages, but each of these left me hanging on a limb waiting for the judges' decision.

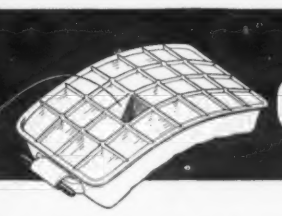
"It was with a distinct feeling of pleasure, therefore, that I read the Kelvinator letter. That company apparently considered me, as a prospect, worth a follow-up letter. The president says so. I recognize that it is a form letter, but it shows careful preparation, it is on embossed paper, it is written in a friendly tone, it shows a desire to hold my buying interest, and it tells me who won the prizes. And it is signed in ink.

"These may seem minor matters, but they create a definite impression that the company is still interested in me. An effective method is used to keep me in a receptive mood for future purchase, after a possible disappointment at not receiving a free Kelvinator.

"It seems to me the national advertisers who sponsor these contests lost sight of the fact that there are so many of them that many times people actually won to the use of a product; frequently they use it simply to try for a prize, and as quickly switch to something else.

"There is a natural reaction of disappointment, sometimes of dislike, after a contest. Women do not look at these contests from an advertising standpoint, but from the angle of their own individual participation in them.

"It would seem to be an important part of every such contest to follow up every entry with a friendly after-contact. Tell the participant who won the prizes; do a little word painting for yourself; remind the prospect of the things that the contest was intended to impress on the mind; and let the contestant know that his or her participation has been honestly appreciated."

A TRAY FULL  OF TRICKS!

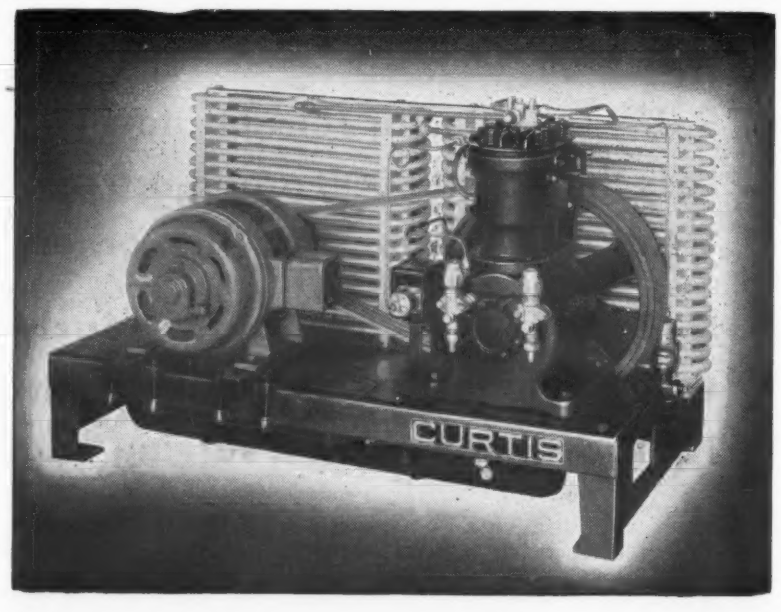
"COLD FACTS"
No. 2

Flexible Rubber Trays and Grids help pay the cost of "cold canvassing." INSIST that all models of the refrigerator you sell come factory-equipped. Write to your manufacturer or direct to us. The Inland Manufacturing Co., Dayton, Ohio.

Prospect: Sorry, but we already have an automatic refrigerator.
Salesman: Then at least you'll be interested in our flexible rubber freezing trays.
Prospect: Indeed I am. We've been talking about them. I'll take two.

Flexible Rubber Trays and Grids

ARE NOW STANDARD EQUIPMENT ON 90% OF ALL AMERICAN MAKES OF AUTOMATIC REFRIGERATORS, AND MANY FOREIGN MAKES



CURTIS REFRIGERATION

Units to fit every need

CURTIS, one of the oldest compressor manufacturers, offers one of the most complete lines of refrigerating units—1/6th to 2 H. P. air cooled; 1/3rd to 15 H.P. water cooled—reflecting 81 years engineering, designing and manufacturing experience. Some desirable territories are still open for reliable distributors. *Write for details.*

81 SUCCESSFUL YEARS ESTABLISHED 1854

CURTIS

Curtis Refrigerating Machine Co.
Division of Curtis Manufacturing Co.
1912 Kienlen Ave., St. Louis, U. S. A.

WHERE DOES THE DEALER COME IN?

Factors of health, comfort, convenience and profit make the appeal of air conditioning so wide that there is not a man, woman or child beyond its range. In fact, air conditioning bids fair to revolutionize modern living, to equal in public acceptance the electric light, the radio, the electric refrigerator. Just what is the dealer's place in this picture?

WHAT KELVINATOR THINKS

Kelvinator believes that the dealer will ultimately be built just as solidly into the air conditioning picture as into that of any of the other electrical appliances which have been so extensively merchandised in past years. But there is a difference.

It is not likely that the degree of standardization reached in ranges, washers, refrigerators and the like can ever be achieved in air conditioning. Every air conditioning job presents a peculiar situation which only a careful engineering survey can solve. Only in this way can equipment be sold intelligently.

PROTECTION FOR THE DEALER

Kelvinator's careful engineering procedure will be the dealer's protection against come-back. For in every instance the equipment selected will do exactly the job called for under the circumstances. No customer will be buying more equipment than he needs, and no customer will be coming back claiming that he is unable to get the result that had been promised.

Further protection to the dealer lies in Kelvinator's experience of more than 20 years in handling problems involving control of temperature and in Kelvinator's carefully engineered and extensive line of air conditioning equipment.

THE LOW INVENTORY ANGLE

The dealer will actually stand to profit greatly from Kelvinator's method of procedure. Since a preliminary engineering survey means that the customer is sold not a piece of merchandise out of stock but an assembly of units designed to accomplish a given result, the dealer will not be required to carry a heavy inventory of such units but a mere sampling.

1 DEALER IN 100

Naturally only the most alert merchandisers among dealers are going to do a first-rate job in the air conditioning field because its problems are more complex than those met in ordinary appliance selling. But to those dealers who do qualify, Kelvinator has seen to it in advance that the Kelvinator air conditioning franchise is an asset of great proportions. From dealers who believe in their ability to handle this tremendous prospective business Kelvinator will be glad to consider applications. . . . KELVINATOR CORPORATION, *14250 Plymouth Road, Detroit, Michigan. Factories also in London, Ontario, and London, England.*

KELVINATOR
Specialists in Controlled Temperatures Since 1914
Air Conditioning
Household Refrigeration
Automatic Heating
Water Cooling
Truck Refrigeration
Beverage Cooling
Ice Cream Cabinets
Milk Cooling
Commercial Refrigeration
for every need of merchants, manufacturers and institutions
EXACT SELECTION

KELVINATOR *Air Conditioning*

AIR CONDITIONING

Chicago Air Conditioning Engineers to Sponsor Show May 20 to 25

CHICAGO — An air-conditioning show, sponsored by the "National Society of Air Conditioning Engineers," will be held in the Merchandise Mart here May 20 to 25, inclusive, in connection with the society's convention.

Air-conditioning manufacturers including refrigerating machinery, fans and blowers, boilers and furnaces, humidifiers and dehumidifiers, filters and air washers, motors and pumps, automatic and hand controls, air testing instruments, registers, grilles, radiators, and other accessories, have been invited to exhibit at the show.

Exhibits will be educational in character, and designed to show the benefits of air-conditioning equipment to engineers, contractors, property owners, professional men, institutional officials, and other potential users.

Admission will be by invitation only, exhibitors, architects, air-conditioning engineers and contractors to be furnished with tickets for distribution among their customers and prospects in the Chicago and Milwaukee area.

In the bulletin announcing the Show, sent to prospective exhibitors last week, it is stated that funds remaining after expenses are paid will revert to the Chicago chapter of the National Society of Air Conditioning Engineers.

Exhibitors' space and display arrangement details are in charge of A. B. Coffman, show manager of Merchandise Mart.

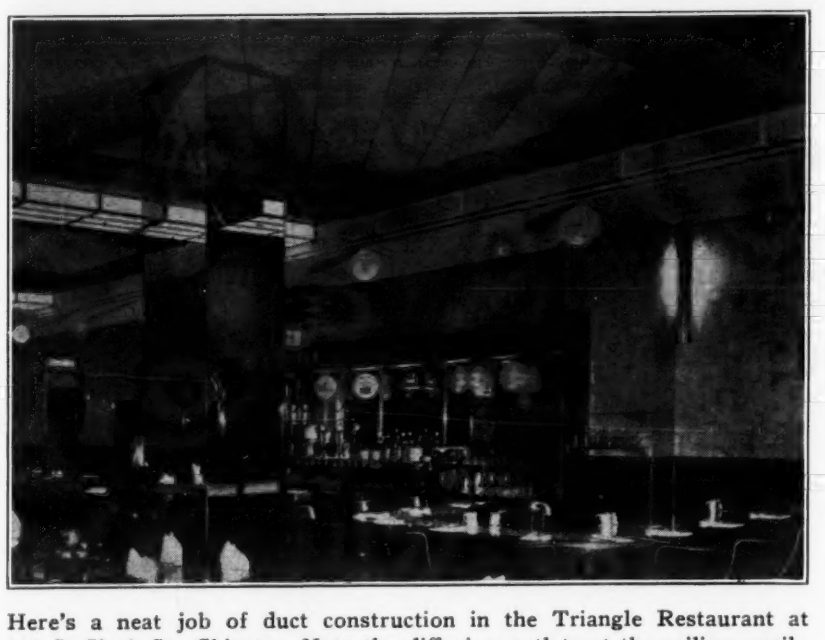
Convention sessions of the society will be held at the same time and on the same floor as the Show, and daily lectures and demonstrations will be open to those attending the show. H. E. Ziel, president, will preside.

On the committee planning for the show are J. C. Hines, chairman, of R. B. Hayward Co.; M. L. Brown, superintendent and chief engineer, Palmolive Building; A. E. Christophersen, chief engineer, Franklin School; Carl Eichstaedt, vice president and sales manager, Reliance Refrigerating Mach. Co.; Dr. E. V. Hill, president, E. V. Hill Co.; H. G. Kreissl, manager, Vento and Arcoblast departments, Montgomery Ward & Co.; G. D. Ladd, buyer, air-conditioning department, Montgomery Ward & Co.; W. R. Lewis, air-conditioning engineer; J. F. McCabe, superintendent, Art Institute; Fred Peterson, chief engineer, Merchandise Mart; Charles Rickner, chief engineer, E. V. Hill Co.; Herbert E. Ziel, chief engineer, Albert Kahn, Inc., and Mr. Coffman.

Two Sterchi Stores Will Handle Crosley Line

HARLAN, Ky.—Sterchi Bros. furniture stores at Middlesboro and Corbin, Ky., are Crosley refrigerator dealers.

Nice Ductwork



Here's a neat job of duct construction in the Triangle Restaurant at 119 S. Clark St., Chicago. Note the diffusion outlets at the ceiling, easily installed and hardly noticeable. The air-conditioning system was installed by the Kroeschell Engineering Co. and is designed and regulated to operate under peak conditions during the luncheon and dinner periods.

Anchor Lite Holds Service Schools

PITTSBURGH—Anchor Lite Appliance Co. here, distributor of Crosley refrigerators and radios in western Pennsylvania, recently conducted a refrigeration service school for dealers and service men. Seventy-four attended the first session, held Mar. 11.

J. W. Dunn, engineer for the Crosley Radio Corp., headed the list of instructors.

Gas-Fired Conditioner Being Developed by A.G.A. and Bryant

BOSTON—Developed by the American Gas Association and the Bryant Heater Co. is a gas-fired summer air-conditioner for homes.

The conditioner is divided into two sections each containing a series of trays filled with silica-gel, a substance which is capable of absorbing 40 per cent of its weight in moisture. The air is passed through one section until the material can take up no more moisture, after which it is automatically switched to another section.

During the period that one section is taking on moisture, the other is being heated by gas to drive out the moisture already taken up. As this moisture is evaporated, it is exhausted outdoors by air circulated through this section independently of the air being conditioned.

After passing through the conditioner, the dry air passes over the cooling coil. Cold water for this coil may be secured from city mains, provided the temperature of the supply does not at any time exceed 70° F. If an adequate water supply is not available from this source, the water may be cooled by ice or by mechanical refrigeration.

York Sales Increase in 5-Month Period

YORK, Pa.—Sales of York air-conditioning equipment have increased approximately 300 per cent during the first five months of the present fiscal year, according to S. E. Lauer, general sales manager of the York Ice Machinery Corp. here.

Several of the company's manufacturing departments are now working three eight-hour shifts per day, Mr. Lauer said.

He reported that greatest demands are for railroad air-conditioning equipment, the new portable air-conditioning unit for small offices and homes, and for ceiling type conditioners.

York Cools Air in Private Offices of Mexican Governor

HERMOSILLO, Sonora, Mex.—York air-conditioning equipment has been installed in Hermosillo for the private offices of Rodolfo Elias Calles, governor of the state of Sonora, and a son of ex-President Plutarco Elias Calles, who is often referred to as "the strong man of Mexico."

Gov. Calles became interested in air conditioning through reading about it in various periodicals, and was stimulated to order it for his office by Ramon Corral, general manager of the Empresa de Servicios Publicos de Los Estados Mexicanos, a utility of the group controlled by the H. W. Byllesby Engineering & Management Corp., Chicago.

Equipment installed in Gov. Calles' office includes two model C-200D-3 (ceiling type) York air conditioners, and one 2-hp. model 428 FW York Freon condensing unit with full automatic controls.

The air-conditioning units were concealed behind ornamental grilles, one at each end of the room. The grilles are of the same width as the air-conditioning units, but twice the height, so that the same grille provides for both supply and return air. This arrangement has produced a uniform distribution of air throughout the room.

Condensing unit was installed in a penthouse on the roof of the building, directly over Gov. Calles' office. Control equipment includes two thermostatic expansion valves, two liquid line solenoid valves, and a thermostat.

The system was designed to maintain an inside dry-bulb temperature of 85° F. and a relative humidity of 50 per cent or less, when outside conditions are 105° F. dry-bulb and 85° F. wet-bulb, S. L. Cordis, York representative in Phoenix and Tuscon, Ariz., reports.

Total heat load was computed to be 1.91 tons of refrigeration per day, and over two tons of refrigeration capacity are available from both the condensing unit and air conditioners installed.

Complete installation was made by Mexican members of the Empresa de Servicios Publicos, and was operated throughout the past summer without any service other than the adjustment of controls.

Pipkin Heads Rex Cole Sales Division

NEW YORK CITY—M. E. Pipkin, wholesale sales manager for Rex Cole, Inc., General Electric distributor, has announced the appointment of E. L. Walters as divisional sales manager for Rockland County.

Mr. Walters, whose headquarters are at Monroe, N. Y., will also continue to direct sales activities in Orange County.

"Present sales in Rockland County show an increase of 10 per cent over those of last year," Mr. Pipkin declared. "We expect this rate of increase to improve as a result of our new program," he stated.

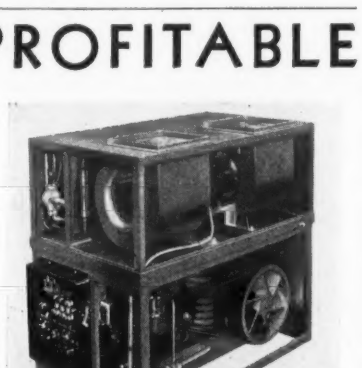
Features of the new program include the appointment of new dealers in Rockland County, and a consistent newspaper advertising and direct mail campaign on G-E products to support the activities of the field organization.

PRACTICAL - DEPENDABLE - PROFITABLE

Lipman AIR CONDITIONING

EQUIPMENT

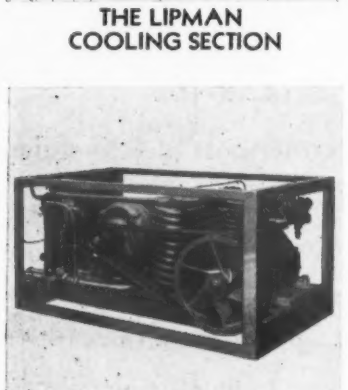
SELF CONTAINED AIR CONDITIONER



SHOWING THE LIPMAN'S PARTS AND CONTROLS

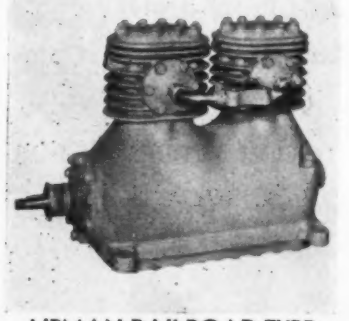
THE LIPMAN COOLING SECTION

THE LIPMAN HEADER TYPE EVAPORATOR

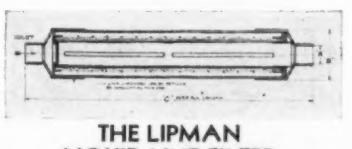


THE LIPMAN CONDENSING UNIT

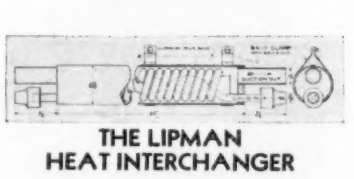
A LIPMAN AUTOMATIC REFRIGERATING MACHINE



LIPMAN RAILROAD TYPE AIR CONDITIONING UNIT



THE LIPMAN LIQUID LINE FILTER



THE LIPMAN HEAT INTERCHANGER

LIPMAN air conditioning equipment comes in a wide variety of types. Every item of manufacture is of highest quality, thoroughly proved, and precision built. All LIPMAN equipment is engineered and designed to give lasting satisfaction to the owner through efficient, economical and dependable performance.

LIPMAN pioneered and developed the sturdy, dependable air conditioning equipment for railway cars. Hundreds of LIPMAN equipped cars now are meeting extremely varied conditions—from 105° with high humidity to 125° with low humidity.

Wherever it is desired to shut out heat, dirt and noise, and to supply clean healthful air at a comfortable temperature, LIPMAN Air Conditioning equipment will serve efficiently and economically. In stores, offices, restaurants, hotels, hospitals, auditoriums, funeral homes, residences, factories, experimental stations, and laboratories LIPMAN equipment can be depended upon to provide the required temperature, humidity and clean air circulation.

LIPMAN Air Conditioning Equipment provides a timely opportunity for more business and larger profits.

Write or wire for details and prices covering LIPMAN Air Conditioning Equipment. Direct factory or dealer franchises available.

GENERAL REFRIGERATION SALES COMPANY

Dept. F-3, Beloit, Wisconsin, U.S.A.

This season the trend is definitely to KRAMER Forget service and quality worries with KRAMER low side applications

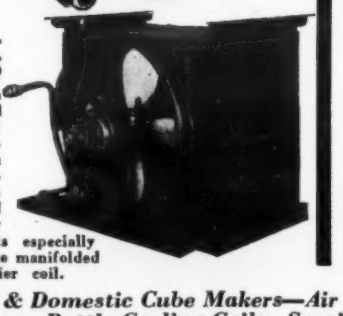
CASE COILS Built to fit in size and capacity

KX Type is illustrated. Twenty standard size variations with capacities that match requirements.

New Literature Now Ready

UNIT COOLERS

Designed with maximum Fin Coil Surface and minimum air flow (CFM) per square foot of surface to permit operation at high evaporator temperature for minimum dehydration effect, and maximum capacity for Condensing Unit. Units especially designed for FREON are manifolded and provided with drier coil.



COMMERCIAL EVAPORATORS

A complete range of overall sizes, various tube and fin spacings to any specified capacity—in ALL COPPER construction, and copper fin steel tube or all steel for ammonia.

Commercial & Domestic Cube Makers—Air and Water Cooled Condensers—Bottle Cooling Coils—Special Applications

TRENTON AUTO RADIATOR WORKS

Main Offices and factory, TRENTON, NEW JERSEY

With Stocks at Branches:— NEW YORK CITY — 210-212 West 65th St. PITTSBURGH, PA. — 5114 Liberty Avenue

5,000 Dealers Open Frigidaire Shows

DAYTON—More than 5,000 Frigidaire dealers—major appliance dealers, department stores, furniture stores, and utilities—last Thursday simultaneously launched the Frigidaire "Spring Parade," tying in with the national program of double page color spreads in national magazines and by large-space newspaper advertising.

In addition, a radio program over 27 stations is bringing prospects into show rooms to participate in a $16,000 prize contest.

Special advertising, special window display, store interior decorations, billboards, direct mail pieces demonstration albums, and door openers have been supplied the dealer organization by the central sales planning and advertising departments, according to Frank P. Pierce, Frigidaire sales manager.

Magazine advertising follows rather closely the advertising released earlier in the year, stressing the super freezer.

Newspaper advertising and billboards carry the message: "Be sure the name Frigidaire is on the refrigerator you buy."

$16,000 Contest Started For Frigidaire Slogans

DAYTON—Announcement of a cash prize contest, which is a part of the current Frigidaire dealers radio program, was made last week by Frank R. Pierce, sales manager, Frigidaire Corp.

The air program, inaugurated Feb. 13 over the Columbia network, utilizes 76 stations each Wednesday at 10 p. m., EST., and features Jack Pearl, radio comedian, now appearing in his new role of Peter Pfeiffer, Patti Chapin, songstress, and Freddie Rich and his orchestra.

The contest offers a total of $16,000 in 333 separate prizes beginning with a capital prize of $1,000 in cash.

"Our purpose in launching a contest at this time," said Mr. Pierce, "is to draw people into Frigidaire retail outlets so they may become better acquainted with the 1935 Frigidaires.

"Prizes will be given from the best 10-word slogans built around the new Frigidaire, the 10 words to begin with the letters used in its name, that is, F, R, I, G, I, D, A, I, R, E, and to be used in the same order in which they appear in the name 'Frigidaire.' Entries must be filed on official entry blanks, which together with complete instructions, are available for the asking at any dealer displaying Frigidaires."

The contest closes officially at midnight, May 29.

Miss Sparkman Gives Refrigerator Hints

MANSFIELD—Three cookery hints—one for cream sauces and gravies and two for uses of the crisping pan—are contained in the column "Do You Know That:" in "Cold Cooking" by Miss Edna I. Sparkman, director of refrigeration home economics for the Westinghouse Electric & Mfg. Co.

"Cream sauces and gravies," writes Miss Sparkman, "may be made with less danger of becoming lumpy if flour and butter are cooked until well blended. Add very little cold water or milk, stir in well, cook until thick, then add more cold liquid. After about a third of the liquid has been added cold, add the remainder hot if you care to make the sauce quickly without stirring too long.

"To crisp vegetables very quickly," she continues, "wash them, then with very little draining, place them in the chill tray for a short time. Do not keep them there too long . . . for to leave them in so cold a place for too long a time, means quick wilting after being removed from the chill tray."

Fresh peas in their pods are good after 10 days or more when stored in a crisping pan, states Miss Sparkman. Those stored in a covered container after the pods are removed retain their flavor fairly well, but if stored uncovered they will lose both appearance and flavor quickly.

Anchor Lite Appoints 4 Crosley Dealers

PITTSBURGH—Appointment of six new dealers to sell Crosley refrigerators was announced recently by C. R. Betts, sales manager of the Anchor Lite Appliance Co., Crosley distributor in this city.

The newly appointed dealers and men who will manage their refrigeration departments, are: McCreery & Co., Pittsburgh, Ray Weiss; R. E. Kaplan Furniture, McKeesport, Herbert Kaplan; Home Furniture Co., Monessen, Sam Stern; Haney Furniture, New Castle, Alvin Shenkan; Jaffe Furniture, Tarentum, Joseph Shenkan; and C. L. Melenyzer, Charleroi, with Mr. Harmony in charge of the department.

WHY IS IT MANY OLD REFRIGERATORS WONT FREEZE DESSERTS?
BECAUSE CHEAP INSULATION HAS OVERWORKED THE UNIT AND WORN IT OUT, YOU DOPE!
AWK!

The Tragedy behind the Kitchen Door, or what happened to the frozen dessert

What stark tragedy is lurking in many a happy home tonight? What proud and unsuspecting hostess will suffer the humiliation that only such a culinary catastrophe can bring about? The rich, the poor, the strong, the weak—who knows in what homes this dread calamity today may be revealed?

Need one question the bitterness involved . . . the maledictions called down upon the makers of these refrigerators . . . the malevolent hate these wounded hostesses will forever after clutch vengefully to their buzzums!

It is not new refrigerators that betray their owners thus. Such treason seldom occurs before two or three years. And then, O tempora! O mores! it is the machine that gets all the blame. But in most cases wrongfully. For no unit can deliver satisfactory refrigeration if the insulation in the cabinet has failed.

The function of the insulation is to prevent heat from penetrating through the refrigerator walls. If the insulation fails, the unit is forced to a life of unremitting toil that wears it out long before its time. Slave away, though it may, it can no longer "make enough cold" to freeze desserts at all, or ice cubes in a hurry.

That is why more and more boxes are being insulated with Dry-Zero. It does not deteriorate in service. Consecrated to a long and faithful life of stopping heat, it has a greater efficiency than any other commercial insulant. It is non-hygroscopic, non-corrosive, permanent.

Dry-Zero costs more than other materials used for insulation. But it will save on current costs from 30 cents when new to as much as $1.50 a month. It offers a permanent advantage to the buyer in dependability and lower running costs, and is one of the most valuable assets any dealer can have who will use this story in his selling canvass.

Dry-Zero Corporation, Merchandise Mart, Chicago, Ill.
Canadian Office, 687 Broadview Ave., Toronto, Ontario.

DRY·ZERO
REG. U.S. PAT. OFF.
THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

SPECIFICATIONS OF AIR CONDITIONING UNITS COMPILED BY ELECTRIC REFRIGERATION NEWS

Specifications of 200 air conditioners which use electric refrigeration for cooling are presented on pages 8, 10, 14, 16, and 18 of this issue.

Manufacturers were asked to supply data by four different classes of equipment: (1) self-contained room air conditioners, with the compressor furnished by the manufacturer inside the cabinet; (2) floor-type air-conditioning cabinets for remote installation of the compressor; (3) suspended-type overhead air conditioners for remote installation; (4) duct-type equipment which is usually installed in a basement or other convenient place from which ducts distribute the air.

Cooling capacity of the units unless otherwise specified, is given in B.t.u.'s per hour with entering air at 80° F. dry bulb and 50 per cent relative humidity and with a saturated refrigerant temperature of 40° F. at the outlet of the evaporator for direct expansion systems and an entering water temperature of 40° F. for cold water circulating systems.

Heating capacity is given in B.t.u.'s per hour with a 2-lb. steam supply, and entering air at 70° F. dry bulb.

Humidification capacity is given in lbs. of water evaporated per hour with entering air at 70° F. and 30 per cent relative humidity.

When manufacturers use some other standard set of conditions for rating their equipment, the variations are noted by the use of asterisks.

Prices are list f.o.b. factory unless otherwise specified.

Blower capacity is given in cubic feet per minute, and velocity in discharge in feet per minute.

Companies represented by specifications and their location in the paper follows:

Buffalo Forge Co. 14
Carraway Engineering Co. 18
Carrier Engineering Corp. 10
Clarage Fan Co. 16
Cochran Metal Products 18
De La Vergne Engine Co. 14
Fedders Mfg. Co. 16
Frigidaire Corp. 8
General Electric Co. 8
General Refrigeration Corp. 8
Ilg Electric Ventilating Co. 10
Kauffman Air Conditioning Corp. .. 14
King Ventilating Co. 18
King Zeero Co. 16
McQuay, Inc. 18
Mellish & Murray 18
Peerless Ice Machine Co. 18
Savage Arms Corp. 16
Scott-Newcomb, Inc. 18
Servel, Inc. 10
Standard Air Conditioning, Inc. 18
Thermal Units Mfg. Co. 16
Trane Co. 16
U. S. Air Conditioning Corp. 18
Westinghouse Electric & Mfg. Co. .. 10
Young Radiator Co. 18

General Electric

General Electric Co.
New York, N. Y.

Functions — Self-contained type: model FR-1—cooling, dehumidifying, heating, humidifying, and cleaning; model FC-1—cooling and dehumidifying. Remote floor type: models AD-3 and AD-4—cooling, dehumidifying, heating, humidifying, and circulating; models AG-1 and AG-2—cooling and dehumidifying. Suspended type: cooling and dehumidifying. Duct type: cooling, dehumidifying, heating, humidifying, and circulating.

Cabinet—Self-contained type and remote type: G-E cabinet with walnut finish. Suspended type: gray finish for all but model AG-4, which has a walnut finish. Duct type: G-E cabinet with gray finish.

Compressor—G-E 2-cylinder compressor. Compressor charge: model FR-1, 5½ lbs.; model FC-1, 3½ lbs. Across the line magnetic motor starter. Condenser pressure high side safety cut-out. Pressure control.

Blower—Self-contained type: model FR-1, two double-inlet multivane, with a.c. capacitor or d.c. tapped series motor; model FC-1, G-E propeller type with a.c. shaded poles or d.c. shunt series motor. Remote floor type: model AD-3, two double-inlet multivane; model AD-4, four double-inlet multivane; others, propeller type; blower motor—AD models a.c. capacitor or d.c. tapped series; AG models a.c. resistance split-phase or d.c. compound. Suspended type: propeller-type blower, with a.c. resistance split-phase or d.c. compound blower motor. Duct type: double-inlet and multivane blower, with three-speed split-phase motor.

Air Circulation—Self-contained type: air intake in end, air discharge in model FR-1 in front, model FC-1 in top; model FR-1 has a G-E louvred grille, model FC-1 a fin-and-bar type grille. Remote floor type: air intake, model AD-3, right end, others, both ends; air discharge, models AD-3 and AD-4, front, others, top. Models AD-3 and AD-4 have G-E louvred grilles, others have G-E turning vane grilles. Suspended type: air intake, model AG-4, ends, others, rear; air discharge, front. Model AG-4 has the G-E turning vane grille, all others have G-E fan guard grille. Fresh air intake provided on models FR-1, AD-3, AD-4, and optional on all other remote floor type, suspended type, and duct-type units.

Cooling System—Self-contained type: direct expansion only. Other types, direct expansion or circulating cold water. Copper cooling coils.

Heating System—Copper heating coils.

Type of Humidifier—Self-contained and remote floor type: open pan. Duct type: extended surface.

Air Cleaning Medium—Dry "adhesive impingement" type.

Controls—Self-contained type: thermostatic expansion valve and water regulating valve. Thermostat and humidistat optional on model FR-1. Remote floor type: thermostatic expansion valve, with thermostat, humidistat and liquid line solenoid valve optional. Suspended type: thermostatic expansion valve, with thermostat and liquid line solenoid valve optional. Duct type: thermostatic expansion valve, humidistat, and thermostat. Liquid line solenoid valve optional.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity—Dehumidification	Sensible Heat	Total	Net Weight	Compressor Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained Type																			
FR-1	$625.00	46	15	3,200	5,050	8,350	576	2 x 2½	390	1	Freon	1/60	820	6	200	....	12,400	1.8	39¼ x 63 x 14¾
FC-1	400.00	29.8	...	1,850	2,800	4,650	368	2 x 1½	400	½	Freon	....	1,400	7	200	....	.....	...	37¼ x 41¼ x 13⅞
Floor Type																			
AD-3	$295.00	46	15	2,220	3,710	5,930	213	.....	....	...	.....	1/60	820	6	200	....	12,400	1.8	39¼ x 36⅜ x 14⅜
AD-4	385.00	78	29.2	4,340	8,180	12,520	298	.....	....	...	.....	1/30	820	6	450	....	22,700	3	39¼ x 50⅝ x 14⅜
													800						
AG-1	175.00	40	...	2,295	3,880	6,175	67	.....	....	...	.....	1/100	900	10	535	....	.....	...	31½ x 31 x 17½
													800						
AG-2	200.00	80	...	4,590	7,770	12,360	83	.....	....	...	.....	1/100	900	10	535	....	.....	...	31½ x 31 x 17½
Suspended Type																			
													800		475				
AG-4	$195.00	80	...	4,590	7,770	12,360	89	.....	....	...	.....	1/100	900	10	535	....	.....	...	24⅛ x 29½ x 16⅞
													860						
AG-12	320.00	122	...	9,270	15,830	25,100	218	.....	....	...	.....	1/20	930	14	1,200	....	.....	...	22 x 38 x 24
													860						
AG-14	370.00	276	...	11,520	19,780	31,300	219	.....	....	...	.....	1/20	930	14	1,200	....	.....	...	22 x 38 x 24
Duct Type																			
													635		1,600		13,000		
AA-3	$620.00	231	211	13,800	23,800	37,600	698	.....	....	...	Freon or cold water	⅛*	555	16	1,400	....	115,000	12.5	81¾ x 48¼ x 28⅞
													510		1,250	....	100,000		

*⅛ (60 cycles) ¼ (50 cycles).

Frigidaire

Frigidaire Corp., Dayton, Ohio

Functions — Self-contained type: models SC-38, SC-75, and SCV-66—cooling and dehumidifying; model SCVH-66 — cooling, dehumidifying, heating, humidifying, and cleaning. Remote floor type: models RV-66, H-3, and H-4—cooling and dehumidifying; others—cooling, dehumidifying, and heating. Suspended type: cooling and dehumidifying, with cleaning optional on model S-150.

Compressor—Frigidaire 2-cylinder with Delco motor, pressure control, and high side safety cut-out. Remote floor type has refrigerant heat interchanger.

Cabinet—Self-contained type: models SC-38 and SC-75—grained walnut finish; others—buff. Remote floor type: H and V models—burled walnut lacquer finish; R models—buff. Suspended type: model S-3—ungrained mahogany lacquer finish; model S-150—brown wrinkle finish on steel.

Blower—Self-contained type: model SC-38—screw type, trailing blades; others—double centrifugal. Remote floor type: double centrifugal. Suspended type: S models—propeller; SU models—twin centrifugal fans.

Cooling System—Direct expansion. Frigidaire cross-fin copper cooling coils.

Heating System—Frigidaire copper heating coils.

Controls — Thermostatic expansion valve, liquid line solenoid valve.

Air Circulation—Self-contained type: air intake in back, air discharge in top; fresh air intake on models SCV-66 and SCVH-66; adjustable grilles. Remote floor type: air discharge in top; fresh air intake on models RV-66 and RVH-66. Suspended type: air intake in rear, discharge in front. Adjustable diffusers on SU models.

Air Cleaning Medium—Filter.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity—Dehumidification	Sensible Heat	Total	Net Weight	Compressor Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self Contained																			
SC-38	$365.00	...	...	.....	.....	.....	360	1½ x 1-7/16	630	½	Freon	1/100	1,120	....	300-400	....	.....	...	42½ x 26⅞ x 19¾
SC-75	525.00	...	...	.....	.....	.....	450	1¾ x 2½	450	1	Freon	1/30	800	....	300-400	....	.....	...	42½ x 30 x 23¾
SCV-66	631.00	...	...	.....	.....	.....	500	.....	....	1	Freon	1/30	...	....	300-400	....	.....	...	30⅝ x 62 x 20⅛
SCVH-66	697.00	...	...	.....	.....	.....	500	.....	....	1	Freon	1/30	...	....	300-400	....	.....	...	30⅝ x 62 x 20⅛
Floor Type																			
RV66	$421.00	...	...	.....	.....	.....	320	.....	....	...	Freon	1/30	800	....	300-400	....	.....	...	30⅝ x 62 x 20⅛
RVH66	486.50	...	...	.....	.....	.....	500	.....	....	...	Freon	1/30	800	....	300-400	....	.....	...	30⅝ x 62 x 20⅛
H3	242.50	...	...	.....	.....	.....	200	.....	....	...	Freon	1/20	...	....	300 400	....	.....	...	31¾ x 39¼ x 14
H4	296.50	...	...	.....	.....	.....	244	.....	....	...	Freon	1/20	...	....	300 400	....	.....	...	31¾ x 39¼ x 14
V3	185.50	...	...	.....	.....	.....	231	.....	....	...	Freon	1/20	...	....	300 400	....	.....	...	43⅝ x 28¾ x 14
V4	289.50	...	...	.....	.....	.....	261	.....	....	...	Freon	1/20	...	....	300 400	....	.....	...	43⅝ x 28¾ x 14
Suspended Type																			
S-3	$223.00	...	...	.....	.....	.....	148	.....	....	...	Freon	1/20	...	....	775	....	.....	...	22 x 24 x 20⅝
SU-34	424.00	...	...	.....	.....	.....	400	.....	....	...	Freon	....	...	....	1,500	....	.....	...	16¼ x 51⅛ x 42⅞
SUH-34	529.00	...	...	.....	.....	.....	480	.....	....	...	Freon	....	...	....	1,500	....	.....	...	16¼ x 51⅛ x 48
SUD-34	677.00	...	...	.....	.....	.....	470	.....	....	...	Freon	....	...	....	1,500	....	.....	...	16¼ x 51⅛ x 48
S-150	.....	138	...	7,100	12,500	19,600	132	.....	....	...	Freon	1/20	...	....	700	340	.....	...	23 x 18¼ x 22⅛

Lipman

General Refrigeration Corp.
Beloit, Wis.

Functions—Cooling and dehumidifying on all models. Heating and humidifying optional.

Cabinet and Compressor—4-cylinder Lipman compressor on model 5-2000 and 10-4000. Century motor with Cutler-Hammer starter and Minneapolis-Honeywell high side safety cut-out. Thermostatic compressor control. Refrigerant charge—10 lbs., model 5-2000, and 16 lbs., model 10-4000.

Blower—Buffalo HVA blower direct-driven by Wagner motor.

Air Circulation—Air intake in CU models in rear, discharge in front. Intake in models 5-2000 and 10-4000 in front, discharge in rear. Fresh air intake optional. Uni-Flo grilles.

Cooling System—Direct expansion.

Controls — Thermostatic expansion valves, humidistat, thermostat, and liquid line solenoid valve on all models. Air by-pass dampers on models 5-2000 and 10-4000.

Air Cleaning—Filters optional.

Surfaces—Lipman copper cooling coils.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity—Dehumidification	Sensible Heat	Total	Net Weight	Compressor Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Duct Type																			
CU2001	$.....	...	...	.....	.....	62,000	....	.....	....	...	Freon	½	1,200	12	2,000	....	.....	.....	20 x 48½ x 31⅛
CU4001	.....	...	...	.....	.....	120,000	....	.....	....	...	Freon	1	1,200	15	4,000	....	.....	.....	27 x 58½ x 37⅛
5-2000	.....	...	...	.....	.....	62,000	....	2⅜ x 3¼	470	5	Freon	½	1,200	12	2,000	....	.....	.....	45⅝ x 52¼ x 30¾
10-4000	.....	...	...	.....	.....	120,000	....	3¼ x 4	450	10	Freon	1	1,200	15	4,000	....	.....	.....	56⅜ x 63½ x 36½
Suspended Type																			
CU2002	$.....	...	...	.....	.....	62,000	....	.....	....	...	Freon	⅓	900	12	2,000	....	.....	...	20 x 48½ x 33
CU4002	.....	...	...	.....	.....	120,000	....	.....	....	...	Freon	½	900	15	4,000	....	.....	...	27 x 58½ x 39⅛

AIR CONDITIONING

York Opens Chicago Office; Hitchens to Direct New Branch

CHICAGO — York Ice Machinery Corp. has opened a new office, specializing in air conditioning, in the Conway building here, to supplement the sales activities of Westerlin & Campbell Co., middle west York sales agents, through a wider range of contacts with architects, consulting engineers, and others connected with air-conditioning projects.

The new organization is in charge of Maurice Hitchen, veteran air-conditioning engineer, and will cover Michigan, Wisconsin, Minnesota, North Dakota, Indiana, and northern Illinois.

Mr. Hitchen's air-conditioning experience includes service with B. F. Sturtevant Co., for whom he was branch manager; with Cooling & Air Conditioning Corp., as president and general manager; and later as head of the Hitchen Engineering Co., which will have quarters in York's Chicago office.

Assisting Mr. Hitchen as supervisor of sales estimating, sales planning, and preparation of proposals and layouts will be M. M. Lawler, formerly with Drying Systems, Inc., and Cooling and Air Conditioning Corp.

While Los Angeles branch manager for the latter firm, Mr. Lawler supervised the air conditioning of the Optical Building of the California Institute of Technology, in which exacting conditioning were produced for grinding the world's largest lens for California Tech's new observatory.

Other members of York's Chicago organization will be F. C. Wood and J. J. Floreth, sales engineers for Westerlin & Campbell, and Harvey Chapin.

Zephyr Distributors at Sales School

UTICA, N. Y. — Distributors of Zephyr Air air-conditioning equipment and their executive personnel, including sales, sales promotion, and service managers, attended the first of a series of educational meetings at the Savage Arms Corp. plant here last week.

The same program will be presented to dealers and retail salesmen at meetings in New York City, Boston, and other principal cities. It covers all important phases of air conditioning, starting with fundamentals, calculations, and methods, and ending with applications of Zephyr Air models and merchandising plans for field operations.

Savage has just added to its line the Zephyr 90, an air washer and all-year conditioner of 4,000 c.f.m. capacity and 10 tons refrigeration. Other models include self-contained room coolers, an air-washer window-ventilator for conditioning without cooling, and other commercial air washers of from 1¼ to 5 tons refrigerating capacity.

Milener & Parkinson Address New York A.S.H.V.E.

NEW YORK CITY—Features of a recent meeting of the New York Chapter, A.S.H.V.E. were a paper by Eugene Milener of the American Gas Association on "Summer and Winter Air Conditioning with Gas," a two-reel sound movie film on sound and noise prevention, and a lecture by J. S. Parkinson, head of the acoustical development section of Johns-Manville Corp.

Mr. Milener reviewed the accomplishments of the gas industry in automatic heating and described the work of the Industrial Gas section of the American Gas Association in developing a summer conditioning unit which will absorb moisture for dehumidifying.

The speaker believes that more installations of summer air conditioning can be satisfactorily supplied by dehumidifying the air than by mechanical cooling with dehumidifying as a by-product. Dehumidifying should be the principal objective, says Mr. Milener.

He described a unit now commercially available for accomplishing dehumidifying, using gas. Silica gel is the absorbent used in this piece of equipment.

The movie illustrated the difference between sounds of high frequency and those of low frequency and the difference in amplitude of sounds.

In his lecture, Mr. Parkinson explained how noise is measured, and used as an example a noise manufacturing machine from which noise issued through a tube in which was inserted a felt-lined tube to show how the sound was absorbed by the material.

Mr. Parkinson stated that the society is at present working on the problem of noise in an attempt to classify all types of heating and ventilating equipment according to the type of sound it emits and the loudness of such sound.

The society also plans to set up maximum standards for the amount of noise permissible in a particular type of room under stated conditions, according to Mr. Parkinson.

Individual Control Used in Cooling Texas Home

DALLAS—A rather unique method of installation is being employed in the air conditioning of E. B. Germany's two-story home here.

Since the building has no basement, the 5-hp. York compressor is being installed in a specially built little building outside the kitchen, and serves a C-600 finned coil air-conditioning unit, installed under the kitchen floor.

Air is taken by ducts to rooms on both floors of the home. The system is not expected to cool the entire building, but individual air supply grilles are installed in various rooms, so conditioned air is available where wanted. The system has capacity to cool either the entire first floor in the day, or the top sleeping rooms at night.

Calculations in installing the system were based on an inside condition of 80° dry bulb temperature with a 55 per cent relative humidity, when the outside temperature is 100° F. with a 76° wet bulb temperature.

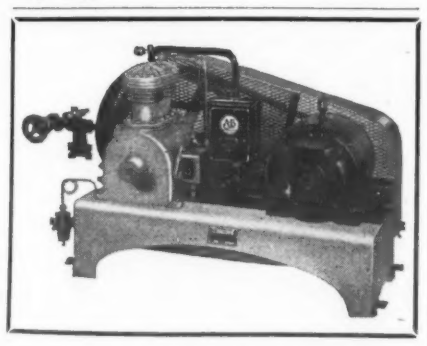
Contractors' Series of Lesson Complete

NEW YORK CITY—The Heating, Piping & Air Conditioning Contractors' national association recently completed its series of lessons on air conditioning with the publication of Part 5, containing the last three of the 18 lessons in the series.

These last lessons contain information and data on the theory of and equipment for steam jet refrigeration, selection and design of steam jet refrigeration equipment, and the application of and equipment for ice cooling.

Material was prepared especially for members of the national association, but copies of the volume are available to non-members at 50 cents each.

The association announced that its supply of Parts 1, 2, and 3 was exhausted, but that a limited number of copies of Part 4 (covering mechanical refrigeration) were available at the same price as for Part 5. Three-ring flexible imitation leather binders to hold the material, are available at $1 each.



FREON UNITS

Fractional up to 50 Tons Air Conditioning Capacity

Reliance Condensing Units have been designed and manufactured to enable the refrigeration contractor to obtain a greater volume of business upon the solid foundation of SUCCESSFUL PERFORMANCE. Compact, rugged and trouble-free you'll find it easier to sell Reliance.

FINNED COILS—All-steel. Galvanized—hot dipped after assembly, giving real metal-to-metal contacts. No electrolytic deposits—no loss in BTU efficiency.

● *Inquiries invited from contractors, engineers and builders of air conditioning equipment.*

RELIANCE

REFRIGERATING MACH. CO., 3409 N. KEDZIE AVE., CHICAGO, ILLINOIS

Export Div.: The A. J. Alsdorf Corp. 223 W. JACKSON BLVD., CHICAGO, ILL., U.S.A. Cable: ALSDORF-CHICAGO.

TO HELP *you* SELL MORE AIR-CONDITIONING EQUIPMENT

GIVE THEM
AIR-CONDITIONING THAT'S
SAFE AND EFFICIENT
and you can, by specifying equipment that uses "Freon," a non-toxic, non-flammable, efficient refrigerant
THE rapidly growing air conditioning industry of the United States has been founded on the fundamental principle of safety. Great manufacturers of refrigeration equipment for air-conditioning are safeguarding the life and health of the public by using the ultra-safe refrigerant "Freon" in their equipment. "Freon" has been completely tested by the Bureau of Mines and the Underwriters' Laboratories and is employed in thousands of installations in homes, hotels, apartment houses, hospitals, railroad cars, office buildings, restaurants, stores, libraries, merchant ships, submarine boats, and other naval craft.
"Freon" is non-toxic and non-flammable and when mixed with air, up to 20% by volume, has no detectable odor. Air conditioning installations containing "Freon" are free of the hazards—fire, explosion, and panic.
Building owners and managers should join with the principal manufacturers of air-conditioning equipment in safeguarding the interests of their tenants when purchasing refrigeration equipment. This may easily be accomplished by specifying "Freon" for reciprocating compressors and trichloromonofluoromethane (F-11) (Carrene No. 2) in centrifugal type apparatus.
"Freon" condensing units of various types and sizes are manufactured by some thirty-odd refrigerating machinery manufacturers. Nearly all air-conditioning systems employ "Freon" or F-11. See that your tenants obtain these safe refrigerants.
In succeeding numbers of this magazine you will find illustrated descriptions of notable "Freon" installations.
FREON
a safe refrigerant
KINETIC
ETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

*...this "**FREON**" advertisement appeared in publications reaching 55,735 of your prospective customers*

These facts about
"FREON"
will help you sell more air-conditioning equipment

1 "Freon" is safe—non-toxic, non-flammable, and when mixed with air, up to 20% by volume, is without detectable odor.

2 "Freon" is used exclusively by the great manufacturers of air-conditioning systems.

3 "Freon" has been tested by the U. S. Government Bureau of Mines and the Underwriters' Laboratories, and was found to be safe.

4 Where safety of life and goods is a requirement, "Freon" is the refrigerant specified.

DURING 1935 "Freon"—a safe refrigerant for air-conditioning and household and commercial refrigeration—will be advertised in publications reaching architects, building owners and engineers; executives in restaurants, hotels, railroads, department stores; and many other of your most valuable and important prospects.

We believe this advertising campaign will prove of benefit generally to the air-conditioning industry, and specifically will help develop immediate prospects for you. Dealers everywhere will find it to their advantage to point out to interested purchasers of air-conditioning equipment the safety features of "Freon"—a safe refrigerant.

FREON
REG. U. S. PAT. OFF.
a safe refrigerant

KINETIC CHEMICALS, INC., TENTH & MARKET STREETS, WILMINGTON, DELAWARE

Westinghouse

Westinghouse Electric & Mfg. Co.
East Pittsburgh, Pa.

Functions—Models SW05, ES05, and ES10: cooling and dehumidifying; models EH10, EL10, ES20, ES24, ES40, ES60, ES64, EL14, and EL14: cooling, dehumidifying, and cleaning; models EH12, EL12, ES22, ES25, ES42, ES45, ES62, ES65, EH14, and EL15: cooling, dehumidifying, heating, humidifying, and cleaning.

Cabinet—All suspended and duct types except models ES05 and ES10 have a Westinghouse-made cabinet finished in brown with aluminum trim. Models ES05 and ES10 have a mahogany cabinet. Self-contained and floor-type models have a mahogany or walnut finished cabinet in modern style.

Compressor—All models which have a compressor use a 2-cylinder unit, except model SW05, which has four cylinders. Westinghouse motors and motor starters are used. All models are equipped with high side safety cut-out.

Blower—Self-contained and remote-type floor conditioners and models ES05 and ES10: Westinghouse screw type with direct drive; others, centrifugal type with belt drive. Westinghouse blower motor.

Air Circulation—Self-contained cabinet type, air intake in left end, discharge in top; remote floor type and models ES05 and ES10, intake both ends, discharge top; all others, intake rear, discharge front. Westinghouse grilles.

Cooling System—Models ES24, ES25, ES44, ES45, ES64, and ES65: cold water; others: direct expansion. Copper cooling coils.

Heating System—Copper heating coils. All heating coils adaptable for hot water systems.

Type of Humidifier—Target spray.

Air Cleaning Medium—Filter.

Controls—Models SW05, EH10, EL10, EH12, EL12, ES05, ES10, ES20, ES22: thermostatic expansion valve; models ES40, ES44, ES60, and ES62: float valve refrigerant control; thermostat optional equipment on all models; humidistat optional on all models providing humidification; models SW05, EH10, EL10, EH12, EL12, ES10, ES20, ES22, ES40, ES44, ES60, and ES62: water regulating valve.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity—Dehumidification	Sensible Heat	Total	Net Weight	Compressor Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self Contained																			
SW05	$.....	...	...	2,330	4,700	7,030	345	.....	1,750	2¼	Freon	....	...	10¼	225	....	.....	...	26⅝ x 38¾ x 13½
Floor Type																			
EH10	$.....	...	...	2,820	8,805	11,625	215	1¾ x 1⅜	1,150	1½	Freon	....	...	10¼	450	....	.....	...	40 x 38¾ x 13½
EL10	.....	...	...	2,820	8,805	11,625	180	1¾ x 1⅜	1,150	1½	Freon	....	...	10¼	450	....	.....	...	26⅝ x 38¾ x 13½
EH12	.....	...	...	2,820	8,805	11,625	255	1¾ x 1⅜	1,150	1½	Freon	....	...	10¼	450	....	25,000	3½	40 x 38¾ x 13½
EL12	.....	...	...	2,820	8,805	11,625	220	1¾ x 1⅜	1,150	1½	Freon	....	...	10¼	450	....	25,000	3½	26⅝ x 38¾ x 13½
EH14	.....	...	...	.....	.....	.....	205	.....	....	...	*Water	....	...	...	450	....	.....	...	40 x 38¾ x 13½
EL14	.....	...	...	.....	.....	.....	170	.....	....	...	*Water	....	...	...	450	....	.....	...	26⅝ x 38¾ x 13½
EH15	.....	...	...	.....	.....	.....	245	.....	....	...	*Water	....	...	...	450	....	.....	3½	40 x 38¾ x 13½
EL15	.....	...	...	.....	.....	.....	210	.....	....	...	*Water	....	...	...	450	....	.....	3½	26⅝ x 38¾ x 13½
*Water or brine.																			
Suspended Type																			
ES05	$.....	...	...	.....	.....	.....	90	.....	....	...	Freon	....	...	10¼	225	....	.....	...	16½ x 18½ x 13½
ES10	.....	...	...	2,800	8,650	11,450	130	1¾ x 1⅜	1,150	1½	Freon	....	...	12	485	....	.....	...	21⅜ x 23¾ x 14
Duct & Suspended Type																			
ES20	$.....	...	...	6,000	19,800	25,800	480	2⅛ x 1⅞	1,150	3	Freon	¼	...	9¼	900	....	.....	...	21 x 32½ x 48
ES22	.....	...	...	6,000	19,800	25,800	585	2⅛ x 1⅞	1,150	3	Freon	¼	...	9¼	900	....	52,000	...	21 x 32½ x 48
ES24	.....	...	...	11,000*	16,500	27,500	460	.....	....	...	†Water	¼	...	9¼	900	....	.....	...	21 x 32½ x 48
ES25	.....	...	...	11,000*	16,500	27,500	565	.....	....	...	†Water	¼	...	9¼	900	....	52,000	7	21 x 32½ x 48
ES40	.....	...	...	12,000	39,600	51,600	790	3 x 3	875	5	Freon	½	...	9¼	1,800	....	.....	...	21 x 54½ x 48
ES42	.....	...	...	12,000	39,600	51,600	920	3 x 3	875	5	Freon	½	...	9¼	1,800	....	106,500	...	21 x 54½ x 48
ES44	.....	...	...	22,000*	33,000	55,000	750	.....	....	...	†Water	½	...	9¼	1,800	....	.....	...	21 x 54½ x 48
ES45	.....	...	...	22,000*	33,000	55,000	880	.....	....	...	†Water	½	...	9¼	1,800	....	106,500	...	21 x 54½ x 48
ES60	.....	...	...	16,650	54,950	71,600	900	3 x 3	1,150	10	Freon	¾	...	9¼	2,700	....	.....	...	21 x 65¼ x 48
ES62	.....	...	...	16,650	54,950	71,600	1,090	3 x 3	1,150	10	Freon	¾	...	9¼	2,700	....	161,000	...	21 x 65¼ x 48
ES64	.....	...	...	33,000*	49,500	82,500	840	.....	....	...	†Water	¾	...	9¼	2,700	....	.....	...	21 x 65¼ x 48
ES65	.....	...	...	33,000*	49,500	82,500	1,030	.....	....	...	†Water	¾	...	9¼	2,700	....	161,000	...	21 x 65¼ x 48
*Cold Water †Water or brine.																			

Carrier

Carrier Engineering Corp.
Newark, N. J.

Functions—Suspended type: cooling and dehumidifying. All other types: cooling, dehumidifying, heating, humidifying, and cleaning.

Cabinet—Steel cabinet. Remote floor type and suspended type have grained walnut finish; duct type, lacquer.

Cooling System—Direct expansion or cold water. Aerofin copper cooling coils.

Blower—Suspended type has Carrier disc fan, all other types have Carrier centrifugal blower. Remote floor type and suspended type are direct driven, duct type blowers are belt driven.

Air Circulation—Air intake on rear and discharge in front on suspended-type model. Inake in base and discharge in top on other types. Fresh air intake provided on all but suspended-type conditioner. Remote floor type has a fixed grille, suspended type an adjustable grille, while on duct type it is optional.

Air Cleaning Medium—Filter.

Controls—Suspended type: thermostatic expansion valve, thermostat and liquid line solenoid valve. Other types: thermostatic expansion valve, thermostat, humidistat, and liquid line solenoid valve.

Heating System—Same coils used as for cooling, with hot water.

Type of Humidifier—Remote floor type: target spray. Duct type: pan.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity—Dehumidification	Sensible Heat	Total	Net Weight	Compressor Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Floor Type																			
48F-2	$.....	...	...	4,700	10,800	15,500	175	.....	....	...	*CH_3Cl	1/30	870	6½	450	-....	25,000	2.7	24 x 42¾ x 12½
*Freon optional.																			
Suspended Type																			
39D	$.....	...	...	7,200	15,000	22,200	185	.....	....	...	*CH_3Cl	1/15	870	16	725	....	.....	...	22 x 22½ x 21½
*Freon optional.																			
Duct Type																			
39L M1	$.....	...	...	11,900	25,400	37,300	650	.....	....	...	*CH_3Cl	¼- ½	715-1,140	12	500-1,000	....	74,600	3.7	75 x 31 x 26
39L M2	.....	...	...	23,800	50,800	74,600	900	.....	....	...	*CH_3Cl	½- ¾	715-1,140	12	1,000-2,000	....	149,200	7.4	75 x 51 x 26
39L M6	.....	...	...	47,600	101,600	149,200	1,650	.....	....	...	*CH_3Cl	1 -1½	530- 765	16	2,000-4,000	....	298,400	7.4	76 x 63 x 49
39L M7	.....	...	...	71,400	152,400	223,800	2,300	.....	....	...	*CH_3Cl	1½-2	530- 765	16	4,000-6,000	....	447,600	11.2	76 x 89 x 49
*Freon optional.																			

Servel

Servel, Inc., Evansville, Ind.

Functions—Self-contained type and remote floor type: cooling, dehumidifying, and cleaning. Suspended type: cooling and dehumidifying. Duct type: cooling, dehumidifying, heating, humidifying, and cleaning.

Air Circulation—Self-contained and remote floor type: air intake in top and rear, air discharge in top on suspended type and duct type: air intake in rear.

Compressor—Servel 2-cylinder compressor for self-contained type, with Wagner repulsion-induction motor, Allen Bradley starter, high side safety cut-out, and pressure control.

Blower—Direct driven by Wagner motor.

Cabinet—Servel cabinet, with walnut finish for all but duct type, which has green finish.

Cooling System—Direct expansion cooling system, with Servel cooling coils.

Air Cleaning Medium—Filter.

Controls—All types: thermostatic expansion valve, thermostat, humidistat, liquid line solenoid valve.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity—Dehumidification	Sensible Heat	Total	Net Weight	Compressor Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained Type																			
ACFU-101 ... *IME/hr.	$600.00	87.10	...	.....	.....	70*	....	.....	....	1	CH_3Cl	1/50	...	....	400	....	.....	...	31 x 67½ x 15¾
Floor Type																			
ACFD-101 ... *IME/hr.	$195.00	87.10	...	.....	.....	85*	....	.....	....	...	CH_3Cl or Freon	1/50	...	....	600	....	.....	...	22½ x 22½ x 22½
Suspended Type																			
ACO-101 ..... *IME/hr.	$195.00	85.85	...	.....	.....	55-110*	....	.....	....	...	CH_3Cl	1/15	...	....	500-1,000	....	.....	...	31¼ x 43 x 13¼
Duct Type																			
ABO-301 .... *IME/hr.	$430.00	231.67	...	.....	.....	300*	....	.....	....	...	Freon	½	...	....	2,700	....	125,000	...	18 x 56 x 55

Ilg

Ilg Electric Ventilating Co.
Chicago, Ill.

Functions—Model 501: cooling, dehumidifying, heating, humidifying, and cleaning; all others: cooling and dehumidifying.

Cabinet—Ilg cabinets, self-contained and remote floor-type models finished in walnut grain metal, others in cream enamel.

Compressor—Self-contained model has 2-cylinder compressor with Ilg motor and motor starter, and equipped with high side safety cut-out.

Blower—Ilg blower, direct driven by Ilg motor.

Air Circulation — Self-contained model: intake in back, discharge in front; remote floor-type models: air intake in front, air discharge in top; suspended type: air intake in back, air discharge in front. Uniflo grilles.

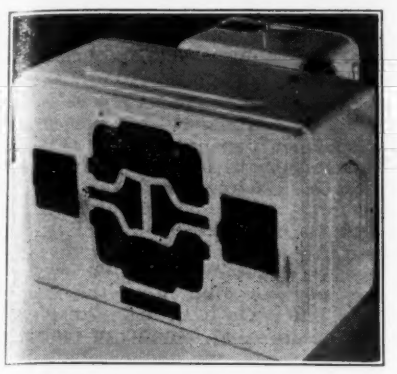
Air Cleaning Medium—Owens-Illinois filter.

Controls—Thermostatic expansion valve all models. Thermostat optional on all models. Self-contained model has liquid line solenoid valve and water regulating valve.

Cooling System — Self-contained type: direct expansion; others: direct expansion or cold water. Ilg copper cooling coils.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity—Dehumidification	Sensible Heat	Total	Shipping Weight	Compressor Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained Type																			
11*	$315.00	...	...	.....	.....	6,000	400	.....	460	½	Freon	1/70	1,140	10	280	500	.....	...	42¾ x 29¼ x 18½
*Spot Kooler.																			
Remote Floor Type																			
500	$185.00	...	...	.....	.....	12,000	185	.....	....	...	*Freon	1/20	1,140	6½	500	380	.....	...	32¾ x 32¼ x 13¾
501	220.00	...	...	.....	.....	12,000	210	.....	....	...	*Freon	1/20	1,140	6½	500	380	46,700	...	32¾ x 32¼ x 13¾
*Freon or methyl chloride.																			
Suspended Type																			
135	$106.00	...	...	.....	.....	14,100	154	.....	....	...	*Freon	1/20	1,140	13	810	620	.....	...	21¼ x 21¼ x 18¾
175	122.00	...	...	.....	.....	20,900	193	.....	....	...	*Freon	⅛	855	17	1,220	650	.....	...	24¼ x 24¼ x 21
195	150.00	...	...	.....	.....	30,400	248	.....	....	...	*Freon	⅛	855	19	1,970	750	.....	...	27¼ x 27¼ x 26¼
255	206.00	...	...	.....	.....	44,500	310	.....	....	...	*Freon	¼	685	25	2,500	650	.....	...	33¼ x 33¼ x 26¾
*Freon or methyl chloride.																			

Len-O-Meter



Leonard's 1935 coin meter has been concealed behind a "recipe" radio which is placed on top of the refrigerator. The current for the four-tube radio and the refrigerator is not available until the payment has been made in the meter.

• • •

Leonard Offers Radio With Coin-Meter

(Concluded from Page 1, Column 4)

meter part of the combination. It is a four-tube set with built-in antenna.

"The new plan lends itself well to advertising and other promotion," says Mr. O'Neil. "Demonstrations will be more dramatic and appealing to prospects. Because it does not look like a meter, it should appeal to purchasers who might otherwise object to having a coin meter on top of their refrigerators. Operation of the recipe radio will be a constant reminder to owners of the meter behind it."

Hendrickson Promoted By Midland Radio Co.

CLEVELAND—E. J. Hendrickson, formerly sales manager of the Midland Radio Co., Sparton refrigerator and radio distributor here, has been named general manager of the firm to succeed Warren Cox, who resigned that position recently.

Mr. Hendrickson entered the radio field in 1923 as sales representative for the Radio Corp. of America in upper New York state and northwestern Pennsylvania. He later was successively district manager for General Electric Co., at Bridgeport, Conn., and general manager for Midland Radio Corp., distributor in the Buffalo-Rochester territory.

He was later with RCA Victor Co. at Camden, N. J., as merchandise manager, at Detroit as manager of manufacturers' sales, and last year was engaged for general manager of Fada Radio Corp., but the organization was liquidated before he began his duties.

Other changes in the Midland Radio Co. personnel include appointment of Frank L. Arnold as sales representative in the territory east of Cleveland to Conneaut, Youngstown, and Warren, Ohio, and west to Sandusky and Norwalk, in addition to calling on some Cleveland dealers.

Mr. Arnold was with B. W. Smith, Inc., Cleveland, Atwater Kent radio, Leonard refrigerator, and Horton washer distributor until his association with Midland Radio Co. He has also been associated with Haas Bros., Majestic Distributing Corp., and Strong, Carlisle & Hammond Co., Philco distributor.

5 Pittsburgh Department Stores to Sell Crosleys

PITTSBURGH—Anchor Lite Appliance Co., distributor of Crosley radios and refrigerators in western Pennsylvania, has announced the appointment of the following department stores as Crosley dealers in the Pittsburgh area: Kaufmann's, Gimbel's, The New McCreery's, Rosenbaum's, and Boggs & Buhl.

Keeping Pace

OUR engineering staff is continually alert to improve the line of ACE HARD RUBBER DOORS, RAILS, JAMBS and other parts for Display Refrigeration Equipment. Manufacturers look to us for standard products and dependable service. They get it.

A complete catalogue will be mailed to manufacturer who wishes to consider Ace products and Ace service.

AMERICAN HARD RUBBER CO.
11 MERCER STREET, NEW YORK, N. Y.
Akron, O. • 111 W. Washington St., Chicago

Zimmerman Urges Low-Cost Market Development

CLEVELAND—P. B. Zimmerman, manager of General Electric's specialty appliance sales department, speaking on the subject of "Developing a Virgin Market," before executives of the Middle West Utilities Co. at the utility's sales conference held at the G-E Institute, stressed the importance of concentrating merchandising activities upon the minimum-bill, or unprofitable customer, in building load for power and light companies.

Mr. Zimmerman declared the new low-priced Liftop refrigerator offered utilities an excellent opportunity for increasing the use of electricity by small-income families and interesting them in other electrical appliances. The meeting was attended by 66 merchandising heads of the utility's various properties.

Sweeney and Timmerman Speak

A. M. Sweeney, sales manager, and W. M. Timmerman, G-E engineer, presented the new 1935 line of General Electric refrigerators and their features, as did H. H. Bosworth, manager of G-E central station division.

The importance of commercial refrigeration as a load builder was discussed by T. Millott. G-E's dishwasher and kitchen program was presented by C. M. Snyder, manager of the dishwasher division, and the range line and features by J. R. Poteat, manager of the company's range division. J. De Jen talked on campaign and sales services and M. D. Grow spoke on the necessity of sales training.

Mr. Zimmerman was chairman of the appliance sessions of the conference and C. O. Brandel of the sessions devoted to G-E's "Better Light—Better Sight" program. Dinner speakers were T. K. Quinn, vice president; C. W. Appleton, and D. C. Green.

Executives at Meeting

Middle West Utilities Co. executives attending were C. W. Amidon, Kansas Electric Power Co., Lawrence, Kan.; John E. Barber, James N. Buell, D. C. Green, R. D. Hayes, George A. Mills, V. H. Moon, E. A. Olsen, R. W. T. Purchas, Edwin Vennard, J. B. Wilson, N. P. Zech, Middle West Utilities Co., Chicago.

M. W. Berg, W. C. Blanchard, Michigan Public Service Co., Holland, Mich.; Price Campbell, T. E. Kuykendall, R. R. St. John, West Texas Utilities Co., Abilene, Tex.; G. A. Donald, Michigan Gas & Electric Co., Ishpeming, Mich.; W. E. Dye, Missouri Gas & Electric Service Co., Lexington, Mo.; F. H. Elvig, Kansas Power Co., Great Bend, Kan.; L. A. Falk, J. E. Louderdale, G. C. Neff, Madison, Wis.; D. J. Frandsen, C. N. Robinson, Public Service Co. of Oklahoma; E. F. Graham, R. M. Winsborough, Southwestern Gas & Electric Co., Shreveport, La.

L. W. Haley, W. Reed, Lexington Utilities Co., Lexington, Ky.; N. B. Head, Jr., Oklahoma Power & Water Co., Sand Springs, Okla.; H. Hemker, F. H. Luecke, W. B. Rich, Missouri Public Service Co., Warrensburg, Mo.; James Hill, Jr., R. M. Ong, Arkansas-Missouri Power Co., Blytheville, Ark.; V. E. Hulett, Oklahoma Power & Water Co., Sand Springs, Okla.; V. M. Johnson, W. H. Sinke, Central Power Co., Grand Island, Nebr.; W. F. Jordan, Kansas Electric Power Co., Lawrence, Kan.; J. C. Kennedy, J. R. McCoy, Central Power & Light Co., Corpus Christi, Tex.; H. S. Kilby, Kansas Power Co., Great Bend, Kan.; R. E. Krafve, L. W. Symonds, Lake Superior District Power Co., Ashland, Wis.; F. E. Kruesi, Northwestern Public Service Co., Grand Island, Nebr.; C. E. Lakin, Western Ohio Public Service Co., Greenville, Ohio; A. Lieberman, Southwestern Gas & Electric Co., Texarkana, Ark.

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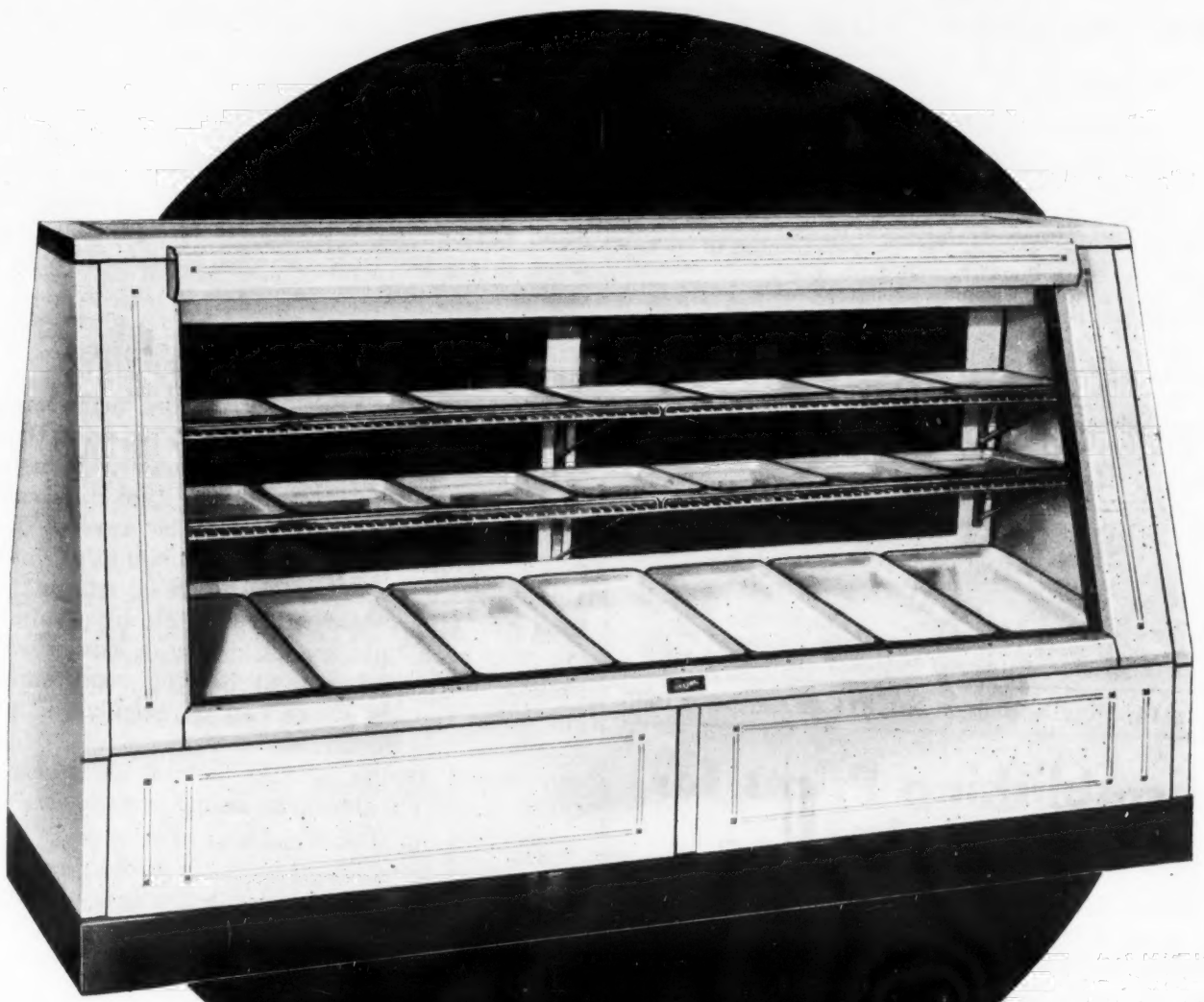
Philco Northwest Chosen By Stewart-Warner

SEATTLE—Philco Northwest Distributors will handle Stewart-Warner refrigerators, reports A. C. MacCallum, president of the distributing firm.



SERIES FIVE

BY

Seeger

All-Service Display Case - - -

The most popular Display Case ever built, because in has 1/3 more display than the usual case. An active salesman for Meat, Grocer and Delicatessen Dealers.

Seeger Series Five displays food attractively, while keeping it in perfect condition. Every modern convenience, as well as the very best of materials and construction are built into this case.

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Saint Paul, Minnesota

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Special Representatives:
Meyer Smith Co., Buffalo, N.Y. Seeger Philadelphia, Inc., Philadelphia, Pa.

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VOL. 14, NO. 13, SERIAL NO. 314, MARCH 27, 1935

Establishing Prices for Air Conditioning

IGNORANCE can probably be blamed for the most distressing situation in the air-conditioning field today: the ridiculously wide margin between price quotations on the same installation offered by competing firms. This ignorance of what a first-class installation of air-conditioning equipment really should cost can be split into two divisions:

(1) Inadequate knowledge of the essentials of a good installation.

(2) Poor guesses, born of inexperience, as to what it costs a distributor or dealer to do business in this field.

This second deficiency on the part of some air-conditioning sales organizations is one of the leading causes of price-cutting. It was found in the earlier days of the commercial refrigeration business, and was especially rife during the big "gold rush period" of apartment house refrigeration sales. In each case, distributors and dealers woke up at the end of the year or two to the fact that the volume of which they had been so proud had been achieved at a loss.

Comparative Cost Data Needed

It seems inevitable that at the beginning of an upward sales trend for any new industry such conditions will prevail. Such practices as uniform cost accounting, standard compensation plans for salesmen, and regulated overhead charges seem to belong to the more stabilized periods of an industry's history. Yet, were comparative costs data available during the "bonanza" periods of a new industry, much grief could be avoided, and the industry probably wouldn't receive the setbacks that seem invariably to fall to the lot of young and eager businesses built on new products.

Some of the larger household and commercial refrigeration organizations, like Frigidaire and General Electric, have exercised close financial control over their distributing outlets from the very beginning. At distributors' meetings the various financial sheets of each operation were compared and discussed, and soon figures were arrived at showing exactly what percentages of gross income should be allowed for each item on the budget in order to insure a profit at the end of the year. Moreover, accountants were sent out from the factory at regular intervals to see to it that distributors were keeping their overhead, promotion costs, and salesmen's commissions within proper bounds.

Were the leading manufacturers of air-conditioning equipment to institute such cost surveys and comparisons among their dealers, and then insist that these dealers follow the general formulae thus arrived at, one of the major causes of price-cutting with its wake of demoralization might be avoided. Furthermore, it should tend to prevent the industry from suffering the occasional setbacks in public acceptance which follow in the train of price-cutting with its attendant sub-standard work.

That thought brings up the other leading cause for the widely divergent quotations which are so puzzling prospective buyers of air-conditioning equipment. As yet there does not seem to be any agreement among the various factors in the industry as to what constitutes a good installation. When mention of installation standards is brought up, one generally hears cries of: "But every installation is different. Each job requires an engineer to figure out just what it needs. How can you standardize in a business like that?"

Agreeing on Installation Standards

True—all too true, distributors accustomed to "package" merchandise will agree—yet there are a good many things on which the industry could agree with regard to installation standards. For instance, it will probably be agreed that every compressor needs a substantial base (many sales organizations have been getting their quotations down to low points by eliminating just such "non-essentials" as a compressor base). Refrigeration and heating requirement per cubic foot of space can be calculated, and standards can be arrived at for controls, ducts, and filters which should insure satisfactory operation of an air-conditioning system.

Establishment of some sort of "red seal" plan of standard installation practices would go a long way toward preventing destructive price-cutting, thus allowing the infant air-conditioning industry to continue its progress without inviting financial disaster for large numbers of concerns which have entered the picture.

Widely Divergent Bids Postpone Sales

Today one of the principal stumbling blocks in the path of a good sales volume for air-conditioning equipment is the fact that when bids are submitted on a job they frequently seem to bear no relation to one another. The prospective purchaser is stumped. He doesn't know whom to believe, and often comes to the conclusion that none of the bidders know what they are talking about. Hence he postpones placing his order until the industry has "settled down," and until air conditioning "gets out of the experimental stage."

Some of the more substantial manufacturers in the industry will be collecting comparative cost data, and will—for the protection of their own good names—establish installation standards. The sooner such information is made available to the industry at large, the better it will be for all concerned. Allowing less well-informed competitors to remain in ignorance is tantamount to eschewing profits, and permits the price-cutter to continue blindly on his way toward the demoralization of a good business.

WHAT OTHERS SAY

Taxes and Recovery

IF AMERICA is to have a real economic recovery its lawmakers and executive officials in Washington must handle the relationship between taxation and prosperity a lot better than some of them have been doing.

Heavy taxes throttle industry and cut down employment. They garrote a nation. And the reverse is true. Relief from avoidable taxation means opportunity, confidence, and progress.

In its annual report, the General Motors Corp. cites a case in point which the gentlemen in Washington should not overlook.

In 1933, a tax of from 6 to 7 per cent of the consumer price of automobiles was removed by the German Government. The action cost the Government 50,000,000 reichsmarks a year. But the consequent gain in car sales provided employment for 40,000 idle men. That saved 40,000,000 reichsmarks of dole expense, and general tax receipts due to growth of business brought in 21,000,000 reichsmarks.

In brief the cut in taxes helped employment, reduced Government expense and increased Government revenue.

Now here's another story. In January of this year about 7,000,000 yards of finished Japanese cotton cloth was sold to American consumers against a total of 7,700,000 yards sold during the whole of 1934. At the same time, cotton producing centers in New England and the Carolinas were finding it difficult to operate. Because of the Nipponese competition many plants had been in the "red" for months.

And a material reason for this condition, so students of the industry say, was and is the processing tax which adds four cents a pound to the price of cotton. There are other causes, but this one is a big contributor to the plight of the American cotton cloth industry.

You cannot squader a nation into prosperity. Equally it is true that you cannot tax a nation into prosperity. —*Detroit Free Press.*

LETTERS

News from Canada

Modern Household Appliances Limited
1106 Beaver Hall Hill
Montreal, P. Q.

Editor:

Would it be asking too much to have our name listed amongst the electric refrigerator distributors for the Province of Quebec in the 1935 edition of the REFRIGERATION DIRECTORY.

The writer has been a subscriber of yours for the past two years and is also part owner of the above-mentioned company. You may also enter our order for a 1935 copy of your DIRECTORY.

We notice in "Personalities" of March 6 issue, you are requesting some news regarding the refrigeration situation in Quebec. During the past year, the market has been very competitive; Westinghouse and Hostess being the biggest contenders in the field and we think that Westinghouse has been well in the lead. We ourselves distributed the Hostess and Chatelaine refrigerator. The cabinet of the later model is a copy of the Crosley refrigerator. The unit is of Canadian development and has been giving very little trouble in the retail field.

In Canada the patents on the Shelvador feature have been defeated by both General Electric and Westinghouse, consequently it does not give us any exclusive feature.

Several American companies such as Universal Cooler, Curtis, Servel, have tried to distribute in Quebec, but seem to have always failed in their operations.

The price on Canadian machines vary from $179.00 on a 4½ cu ft. to $272.00 on a 7 cu. ft. Lift top models had been offered at $115.00 but have not found any public acceptance.

The features in models of the 1935 units have not been made public yet, but as soon as they are, we will be glad to forward you any information you may desire.

MODERN HOUSEHOLD APPLIANCES, LTD.

Ludwig Hommel in Philly?

Trilling & Montague
Walnut St. at 24th, Philadelphia

Editor:

From the March 6 issue of ELECTRIC REFRIGERATION NEWS:

"Three thousand housewives were at the Philadelphia show, given by *Ludwig Hommel & Co.*"

You may be interested in knowing that for the last several years Trilling & Montague have been Norge distributors in Philadelphia: Ludwig Hommel & Co.—our esteemed colleagues—are distributors of Norge products in the Pittsburgh area.

D. WEPMAN,
Advertising Manager.

Answer: Well does ELECTRIC REFRIGERATION NEWS know the correct locations of Trilling & Montague, as well as Ludwig Hommel & Co., two of the largest electrical appliance distributorships in the whole country. For this ridiculous error, the entire editorial staff of ELECTRIC REFRIGERATION NEWS hangs its head in shame.

Dat Ol' Debil Insulation

Dry-Zero Corporation
Merchandise Mart
Chicago, Ill.
March 20, 1935.

Editor:

The continuous flow of "service" articles appearing in ELECTRIC REFRIGERATION NEWS are doubtless of considerable value to the industry.

But on page 18 of your March 6 issue there appeared lesson 24 of the refrigeration home study course prepared by the Refrigeration and Air Conditioning Institute of Chicago," dealing with refrigerator cabinets. It contains an ingenuous dissertation on insulation. Some of the statements made and explanations advanced are sadly like the statement of the gentleman who said: "Radio is the travel of sound waves and this is easily proved by listening at the same time to what goes into the mike and comes out of the receiver—you will find they are the identical sounds!"

The writer's difficulties would be unimportant if there were not already too many misconceptions abroad regarding insulation and its functioning. Fear of adding to the confusion deters me from pointing out more than a few of the discrepancies.

The writer of the article seems not only confused by but oblivious to the difference between *heat* and *air particles*. For example, he writes that heat insulants "depend for the effectiveness on the formation of millions of extremely small air spaces within the solid part of the substance." He continues: "Each tiny chamber must be completely sealed off from all the others so that it is impossible for air to pass through from one point to another in the mass."

Without going into this technically, it may be pointed out that dry light fine mineral wool, without a single sealed-off chamber or cell, yields a higher insulation value than dry corkboard with its millions of closed cells —which I suppose the author of the article had in mind.

Again, writing of moisture, he makes the hoary statement that its effects on efficiency depends on the per cent of the insulant's own weight that the absorbed moisture represents. The insulant's weight has nothing in the world to do with it. To show the absurdity of such a statement consider two insulants of similar texture type, but one four times the weight of the other. On introducing into each insulant an equal amount of moisture per board foot, we find closely parallel reduction of efficiency in each—yet the weight of water is 20 per cent of that of the heavier material and 80 per cent of that of the lighter!

Furthermore, nothing is said of the bearing of the hygroscopic and non-hygroscopic nature of insulants on the practical aspects of durability and efficiency.

It is needless to continue picking flaws like these.

But I must rise to a point of personal privilege! The writer refers to "kapok or Dry-Zero." Even he will admit that, as a satisfactory insulant, loose granulated cork does not compare with good corkboard. Yet the difference between loose, or packed, kapok and the "grained" and minutely uniform semi-felted batt of Dry-Zero is far greater, thermally, physically and with reference to permanence, than the difference between granulated cork and corkboard.

It seems to me that a simple concise article on the theory of insulation, the practical problems connected with its use in the refrigerators, and its effects upon operating costs—repairs and maintenance — would be helpful to many of your subscribers.

HARVEY B. LINDSAY, President.

The Neglected Architect

American Architect
572 Madison Ave., New York City

Editor:

Somewhat belatedly I read the letter of Clarence F. Pratt, California Refrigerator Co., published on page 10 of your issue of Feb. 27. Mr. Pratt urges a campaign among architects and designers to encourage them to provide adequate space and proper connections for the installation of mechanical refrigerators.

I heartily agree with your correspondent. Any person who plans a modern kitchen must have dimensions and clearances readily at hand. Two years ago I undertook to assist our readers by preparing a Reference Data article on "Household Kitchen Planning," which stressed both the organization of elements in the plan and the dimensions and clearances required by commercially available units.

The task was unnecessarily difficult because manufacturers do not ordinarily publish adequate information about their own products as to sizes, swing of doors, and the amount of space required around the cabinet for proper ventilation of the unit.

Another point of great importance to the industry is a better knowledge of what storage and ice-making capacity a refrigerator should have to meet the needs of different sized families. At present, members of the industry are fighting among themselves to develop units of minimum cost. This effort almost invariably results in producing units of minimum size. An enormous market could be developed if buyers were taught to purchase according to capacity rather than price. Certainly the planner who now leaves room for a 4-cu. ft. refrigerator when he should provide space for one of 8 or 10 cu. ft., cannot be blamed if he has no sound information to guide him.

The industry will improve its immediate market and will forestall many losses in future markets if it will supplement its present consumer efforts with data for planners on recommended capacities, actual sizes, and required clearances.

The planner operating professionally and influencing more projects in the course of a year than any other type of individual, is the architect. He is the key factor in this whole situation and he has been sadly neglected. In many ways the architect is more important than the consumer.

Mr. Pratt's recommended campaign should begin with architects. Eventually it would be advantageous also to carry planning data to builders, building owners and all consumers when funds permit.

TYLER STEWART ROGERS,
Technical Editor.

Greetings from Rio

Rua Lucio de Mendouca, 46
Rio de Janeiro, Brazil

Editor:

Greetings from Rio, where we need refrigeration the year round.

Please send all back issues and future issues of the NEWS to me at the address above.

JAMES H. HILL.

AIR CONDITIONING

Pittsburgh Air-Conditioning Installations

Type of Establishment	Prior to 1933 No.	Prior to 1933 Hp.	During 1933 No.	During 1933 Hp.	During 1934 No.	During 1934 Hp.	Total Thru 1934 No.	Total Thru 1934 Hp.
Residences	..	..	2	6	11	9.5	13	15.5
Offices	2	2	9	25	27	106	38	133.0
Small Stores	2	22	3	14	8	117	13	153.0
Large Stores	1	590	..	..	..	..	1	590.0
Restaurants	4	223	2	10.5	6	101.5	12	335.0
Theaters	7	2,377	..	..	..	..	7	2,377.0
Hospitals	..	..	..	..	..	..	..	....
Hotels (Including Restaurants)	..	..	1	1.5	2	23	3	24.5
Industrial	1	493	..	..	1	10	2	503.0
Miscellaneous	1	4	..	..	3	65	4	69.0
Total	**18**	**3,711**	**17**	**57**	**58**	**432**	**93**	**4,200.0**

Pittsburgh Sales of Conditioners Gain

(*Concluded from Page 1, Column 2*)
use of air conditioning was in offices throughout the city. During last year, 27 air-conditioning and comfort cooling systems were installed in places of this type, to lead by far in point of number. Previous to 1934, only 11 offices in the city were equipped with air-conditioning equipment.

A second notable gain during 1934 was registered in the residential field. Eleven installations of air-conditioning systems in Pittsburgh homes were reported last year, against but two in all the years previous.

Small stores in the city also increased their use of comfort cooling, eight installations of this sort being recorded last year, compared with a total of five in years prior to 1934.

Another classification in which considerable pickup in air-conditioning business was noted was restaurants, the six installations made last year equaling the total reported up to that time in the city.

Two of the city's hotels also installed air-conditioning equipment during the year, to double the number of installations of this type, since only one small unit had been in use previous to that time.

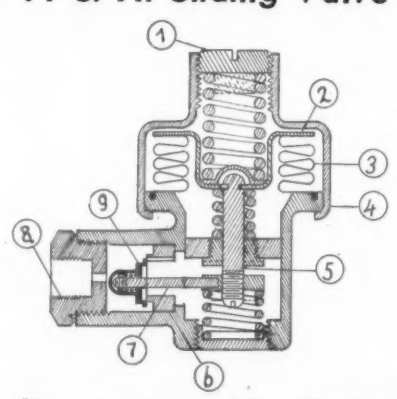
Three installations of miscellaneous nature, totaling 65 connected hp., were also made in the city last year, and one industrial application.

No installations were reported in the city's theaters, seven having installed air-conditioning systems totaling 2,377 hp., prior to 1933. Other fields in which comfort cooling activity during the year was at a standstill were large stores and hospitals. To the present, no installations have been reported made in buildings of the latter type.

As in most of the cities studied in this nation-wide survey of air-conditioning applications, the tendency in Pittsburgh is toward a larger number of installations and a smaller average hp., as is illustrated by the following table:

	No. of Installations	Total Connected Hp.	Average Hp. Per Installation
During 1934.....	58	432	7.45
During 1933.....	17	57	3.35
Before 1933.....	18	3,711	206.16
Total	**93**	**4,200**	**45.15**

F. & H. Sliding Valve



Key to parts: (1) adjusting screw; (2) bellows seal; (3) bellows; (4) moisture tight caps; (5) floating push rods; (6) seats; (7) valve opening and closing rods; (8) inlet connections; (9) floating sliding valves.

F & H Introduces New Expansion Valve

DETROIT—F. & H. Mfg. Co. here has just introduced a new automatic sliding expansion valve, with "floating" moving parts.

The valve can be used for new refrigeration installations or for replacement purposes.

Seat of the valve is made of bronze, the body of brass, and the sliding valve-disc of Monel metal. Entire valve is hermetically sealed with a rubber cap, and is adjustable without removing any parts.

Outlet is standard for ¼-in. female pipe thread, the inlet with a flare nut for ¼-in. copper tubing. Range of the valve is from 25 in. of vacuum to 50 lbs. back pressure.

BOOKS

A.S.H.V.E. Guide

American Society of Heating and Ventilating Engineers Guide, 1935. Published by American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York City.

THIRTEENTH edition of the American Society of Heating and Ventilating Engineers Guide is a usable and handsome book. It contains 1,000 pages, a large portion of which are devoted to the treatment of air conditioning in all its various engineering phases. Problems and their solutions are presented at the conclusion of each chapter, making the book suitable for use as a classroom textbook as well as for home study.

For instance, the chapter on Unit Air Conditioners and Conditioning Systems has this set of problems. We select this chapter because it happens to be an entirely new one.

1. Are unit conditioners necessarily self-contained?
2. Are ducts used with unit conditioners?
3. What is the meaning of the term condensing unit in relation to unit air conditioners?
4. Why are metal surface cooling elements instead of liquid spray chambers used in the design of most unit air conditioners and unit coolers?
5. Why are air-conditioning units with metal cooling surfaces not desirable for all industrial jobs?
6. Why is accurate control of relative humidity with surface more or less complicated?
7. What in general are the characteristics of unit conditioner operation using surface coils?

As an example of the answers given, here is the solution to Problem No. 4 listed above:

"The first cost of the surface cooling type of unit is considerably less than the cost of spray type equipment. Further, the requirements of many industrial air-conditioning jobs and of all comfort-cooling jobs where unit equipment is applicable can often be effectively met with the use of surface type units, with a reduction in the space required for making the installation. Where space conditions are especially limited, the cross-sectional area of the surface cooler can be reduced because of the resulting increase in velocity over the coil surface increases the effectiveness of the surface, whereas in increase in velocity through a liquid spray would reduce its effectiveness."

Engineers who have worked to compile the 1935 Guide do not claim that they have supplied the *only* answers to these problems, but they do claim a conscientious interpretation by a competent engineer whose analysis has been carefully reviewed by the Guide Publication Committee.

In addition to the 41 chapters of text, there is the Catalog Data Section, Index to the Technical Data Section, and the roster of members of A.S.H.V.E.

More data has been added to the Heat Transmission Tables, liberally supplemented with sketches, and the Psychrometric Chart is an innovation. Method of using the chart is fully explained.

More than 200 members of the A.S.H.V.E. have cooperated to make the Guide for 1935 complete, up-to-date, and authoritative.

The 1935 Guide includes chapters on: Fundamentals of Heating and Air Conditioning; Ventilation and Air Conditioning Standards; Industrial Air Conditioning; Natural Ventilation; Heat Transmission Coefficients and Tables; Air Leakage; Heating Load; Cooling Load; Central Air Conditioning Systems; Cooling Methods; Humidification and Dehumidification; Unit Air Conditioners and Conditioning Systems; Unit Heaters, Ventilators,, and Coolers; Automatic Control; Air Pollution; Air Cleaning Devices; Fans and Motive Power; Sound Control; Air Distribution; Air Duct Design; Industrial Exhaust Systems; Fan Systems of Heating; Mechanical Warm Air Furnace Systems; Gravity Warm Air Furnace Systems; Boilers; Chimneys and Draft Calculations; Fuels and Combustion; Automatic Fuel Burning Equipment; Fuel Utillzation; Radiators and Gravity Convectors; Steam Heating Systems; Piping for Steam Heating Systems; Hot Water Heating Systems and Piping; Pipe, Fittings, Welding; Water Supply Piping; Insulation of Piping; District Heating; Radiant Heating; Electrical Heating; Test Methods and Instruments; Terminology.

Cochran Conditioner Is Self-Contained

TRENTON, N. J.—Cochran Metal Products has developed self-contained, portable air-conditioning units for use in hotels, hospitals, homes, and similar places. First announcement of the new machine is being made this month.

The machine is of the down-draft type, and heats, cools, humidifies, dehumidifies, filters, and purifies the air before circulating it through the room. It operates for cooling on wet or dry ice or by a refrigerating unit. The heating unit operates on gas, electricity, or by connection with the installed heating system.

All units are self-contained in a cabinet 15 in. x 15 in. x 30 in., portable and mounted on ball-bearing castors.

Keeping the base size, these units have been designed to fit many applications. For the hotel, there is a unit to take the place of the present telephone stand. The type for the cocktail room is built into a table of regulation height, but with three standard sizes of tops. Hospital equipment is designed for the operating room and to meet the conditions there.

Temprite Feature Series
(No. 3)

SMALL SIZE - - HIGH CAPACITY

BY REASON of their exclusive principle of direct heat transfer, Temprite Coolers combine small size and high capacity to a degree not attained by any other liquid coolers.

TEMPRITE 80° 40° INSTANTANEOUS

Refrigeration Distributors

Temprite Beer, Water and Beverage Coolers have achieved outstanding success in the field. We shall be glad to furnish you with complete information.

TEMPRITE PRODUCTS CORPORATION
(Formerly Liquid Cooler Corp.)
"Originators of Instantaneous Liquid Cooling Devices
Detroit - - - - - - Michigan

To maintain a good reputation over the course of years a product must be intrinsically good and its performance consistently dependable. The high regard with which Universal Cooler units are regarded by the public and the trade indicates the strict quality standards to which Universal Cooler adheres in all its manufacturing policies.

UNIVERSAL COOLER CORPORATION
DETROIT, MICHIGAN BRANTFORD, ONTARIO

MANUFACTURERS OF A COMPLETE LINE OF HOUSEHOLD AND COMMERCIAL REFRIGERATION EQUIPMENT

Buffalo Forge

Buffalo Forge Co.
Buffalo, N. Y.

Functions—Remote floor-type: cooling and dehumidifying, with heating, humidifying, and cleaning optional; suspended-type: cooling and dehumidifying, with heating, humidifying, and cleaning optional for models 254FSC, 354FSC, 454FSC, 252FSC, 352FSC, and 452FSC; duct-type: cooling, dehumidifying, heating, humidifying, and cleaning.

Blower—Buffalo Forge centrifugal-type blower for all models except SC series in suspended-type conditioners, which use Buffalo Forge propeller type. All blowers are direct connected, except duct-type models, which are belt driven.

Air Circulation — Self-contained models have air intake in bottom, discharge in top; all others have air intake at back, air discharge in front. Remote floor-type models have elbow discharge outlets, all others have fan-type outlets except SC models in the suspended type, which have louvred type.

Cabinet—Buffalo Forge cabinet, with galvanized finish for all but SC series in suspended-type line, which are cadmium plated.

Controls—Furnished as required for the specific installation.

Cooling System—Direct expansion or cold water cooling in all models. Aerofin copper cooling coils.

Heating System—Aerofin copper heating coils. All models adaptable to hot water heating systems.

Type of humidifier—Pan and coil.

Air Cleaning Medium—Dustop filter.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Shipping Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Duct Type																			
121PC	$	92	66	10,300	20,000	30,300	600					¼	955	11½	800	800	57,000	10	21 x 27 x 82
122PC		183	128	20,600	40,000	60,600	875					½	955	11½	1,600	800	114,000	20	21 x 47 x 82
123PC		275	128	30,900	60,000	90,900	1,200					¾	955	11½	2,400	800	155,000	30	21 x 61 x 82
152PC		366	262	41,250	80,000	121,250	1,500					1	830	15	3,200	900	228,000	40	29½ x 61 x 91
153PC		549	370	62,000	120,000	182,000	1,950					1½	830	15	4,800	900	342,000	60	29½ x 81 x 91
182PC		732	394	82,500	160,000	242,500	2,500					2	543	19	6,400	1,080	430,000	80	41½ x 72 x 113
Remote Floor Type																			
254FC	$	257	*	21,150	63,250	84,400	925					1	1,150	11½	2,850	1,350	.....	...	90 x 47 x 18
354FC		394	*	31,750	94,500	126,250	1,200					1½	1,150	11½	4,280	1,350	.....	...	90 x 68 x 18
454FC		512	*	42,250	126,500	168,750	1,450					2	1,150	11½	5,700	1,350	.....	...	90 x 86 x 18
252FC		128	*	13,700	41,400	55,100	800					1	1,150	11½	3,240	1,500	.....	...	90 x 47 x 18
352FC		197	*	20,700	62,000	82,700	1,050					1½	1,150	11½	4,860	1,500	.....	...	90 x 68 x 18
452FC		256	*	27,500	82,500	110,000	1,250					2	1,150	11½	6,480	1,500	.....	...	90 x 86 x 18
*As required.																			
Suspended Type																			
254FSC	$	257	*	21,150	63,250	84,400	950					1	1,150	11½	2,850	1,350	.....	...	18 x 47 x 46
354FSC		394	*	31,750	94,500	126,250	1,250					1½	1,150	11½	4,280	1,350	.....	...	18 x 68 x 46
454FSC		512	*	42,250	126,500	168,750	1,550					2	1,150	11½	5,700	1,350	.....	...	18 x 86 x 46
252FSC		128	*	13,700	41,400	55,100	825					1	1,150	11½	3,240	1,500	.....	...	18 x 47 x 40
352FSC		197	*	20,700	62,000	82,700	1,100					1½	1,150	11½	4,860	1,500	.....	...	18 x 68 x 40
452FSC		256	*	27,500	82,500	110,000	1,350					2	1,150	11½	6,480	1,500	.....	...	18 x 86 x 40
413SC		78	*	4,650	13,950	18,600	175					1/20	1,750	12	700	530	.....	...	18 x 22½ x 17
417SC		95	*	6,300	18,900	25,200	240					1/20	1,150	16	880	410	.....	...	23¼ x 25½ x 19
419SC		156	*	11,300	33,900	45,200	330					⅛	1,150	18	1,630	530	.....	...	27 x 28½ x 19¾
213SC		56	*	3,000	9,000	12,000	125					1/20	1,750	12	820	620	.....	...	18 x 22½ x 17
217SC		69	*	4,000	12,000	16,000	180					1/20	1,150	16	1,040	490	.....	...	23¼ x 25½ x 19
219SC		113	*	7,300	22,000	29,300	240					⅛	1,150	18	1,915	630	.....	...	27 x 28½ x 19¾
*As required.																			

De La Vergne

De La Vergne Engine Co.
Philadelphia, Pa.

Functions—Models 1AA and 1.5AA: cooling, dehumidifying, heating, humidifying, and cleaning. Others: cooling, dehumidifying, heating, and cleaning.

Cabinet—Wood or metal cabinet with walnut or mahogany finish for all but model 4AA, which is metal cabinet with finish as desired.

Compressor—De La Vergne 2-cylinder compressor, with high side safety cut-out and special type of compressor control.

Blower—Direct driven.

Air Circulation—All but model 4AA have air intake in side, air discharge in top. Model 4AA has air intake in front and bottom, with air discharge in the front face of the unit. De La Vergne grilles. Fresh air intake provided on all models.

Cooling System—Direct expansion. De La Vergne copper cooling coils.

Heating System—Models 1AA, 1.5AA, and 4AA: by reversed refrigeration cycle; others by steam. De La Vergne copper heating coils.

Control—Float valve refrigerant control.

Air Cleaning Medium—Filter.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Shipping Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained Floor Type																			
1-AA	$	250	250	.....	.....	12,000	1,000	.....	1,750	1½	Freon	¼	1,150	9½ & 11	400-750	200	.....	...	48 x 52 x 22
1-AW		500	...	.....	.....	12,000	1,000	.....	1,750	1½	Freon	¼	1,150	9½ & 11	600	300	.....	...	48 x 52 x 22
1.5-AA		250	250	.....	.....	18,000	1,000	.....	1,750	2	Freon	½	1,750	9½ & 11	600-1,000	300	.....	...	48 x 52 x 22
1.5-AW		500	...	.....	.....	18,000	1,000	.....	1,750	2	Freon	½	1,750	9½ & 11	800	400	.....	...	48 x 52 x 22
*4-AA		500	250	.....	.....	48,000	1,500	.....	1,750	5	Freon	1	1,750	12	1,500	750	.....	...	18 x 62 x 60
*This unit for suspension.																			

Kauffman

Kauffman Air Conditioning Corp.
St. Louis, Mo.

Functions—Self-contained models: cooling, dehumidifying, and cleaning. Remote floor type: cooling, dehumidifying, heating, humidifying, and cleaning. Suspended type: cooling and dehumidifying. Duct type: cooling, dehumidifying, and cleaning.

Cooling System—Kauffman copper cooling coils, aluminum fins.

Blower — Self-contained models: multi-blade and propeller type blower, driven by Baldor or Wagner capacitor motors. Remote floor type: centrifugal blower. Suspended type: propeller-type blower. Duct type: multi-blade blower.

Cabinet—Kauffman cabinet. Self-contained, remote floor type, and suspended-type models finished in walnut or mahogany; duct type in gray or black.

Type of Filter—Spun glass.

Air Circulation — Self-contained models: air intake, back; discharge, top. Remote floor type: air intake bottom, discharge top; multi-vane grilles. Duct type: air intake back, discharge front.

Compressor—Two-cylinder compressor used in self-contained model. Refrigerant charge: models F & K, 3 lbs.; models I and L, 7 lbs.

Controls—Self-contained type: high pressure cut-out, thermal overload, solenoid water valve. Duct type: thermostat and humidistat.

Heating System—Kauffman copper heating coils, aluminum fins.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained																			
F	$400.00	92	...	.....	.....	7,000	350	1⅝ x 1⅝	550	½	Freon	1/20	1,140	(4) 4½	275	....	.....	...	38 x 15 x 30
I	550.00	141	...	.....	.....	14,000	450	1⅞ x 1⅝	700	1	Freon	1/15	850	(4) 6	500	....	.....	...	45 x 17 x 32
K	300.00	92	...	.....	.....	7,000	300	1⅝ x 1⅝	550	½	Freon	1/50	1,140	(1) 12	250	....	.....	...	36 x 15 x 32
L	475.00	141	...	.....	.....	14,000	425	1⅞ x 1⅝	700	1	Freon	1/50	1,140	(1) 16	500	....	.....	...	43 x 17 x 32
Duct Type (ceiling)																			
62H	$235.00	300	150§	.....	.....	46,600*	350†	.....	....	...	Freon	1/10	850	6	800	....	66,000‡	...	16 x 33 x 33
75H	350.00	441	200§	.....	.....	62,400*	470†	.....	....	...	Freon	⅛	800	7½	1,100	....	104,000‡	...	18½ x 36 x 36½
76H	465.00	510	247§	.....	.....	90,000*	571†	.....	....	...	Freon	¼	870	7½	1,500	....	140,000‡	...	18½ x 43 x 36½
92H	581.00	840	405§	.....	.....	128,000*	650†	.....	....	...	Freon	½	720	9	2,500	....	208,000‡	...	22 x 47 x 39
93H	685.00	1,050	510§	.....	.....	167,240*	1,050†	.....	....	...	Freon	½	750	9	3,700	....	312,000‡	...	22 x 69 x 39
94H	775.00	1,506	750§	.....	.....	220,500*	1,140†	.....	....	...	Freon	1	720	9	5,000	....	388,000‡	...	35 x 65 x 39
122H	789.00	1,470	750§	.....	.....	220,560*	1,228†	.....	....	...	Freon	1	750	12	6,200	....	388,000‡	...	30 x 61 x 44
123H	975.00	2,280	1,125§	.....	.....	315,120*	1,561†	.....	....	...	Freon	1½	680	12	8,200	....	556,000‡	...	30 x 36 x 44
124H	1,055.00	2,280	1,125§	.....	.....	401,880*	1,716†	.....	....	...	Freon	2	720	12	10,500	....	708,000‡	...	30 x 110 x 44

§Cost of heating coil added. * Maximum capacities 6-row coil—capacity reduced with reduced number of coils. †Weight of unit with smallest coil—unit with larger coils proportionately heavier. ‡Maximum capacities 3-row coil—capacity reduced with number of coils.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Duct Type (floor)																			
62V	$436.00	300	150§	.....	.....	46,600*	543†	.....	....	...	Freon	1/10	850	6	800	....	66,000‡	...	89 x 33 x 14½
75V	485.00	441	200§	.....	.....	62,400*	635†	.....	....	...	Freon	⅛	800	7½	1,100	....	104,000‡	...	92 x 36 x 17
76V	595.00	510	247§	.....	.....	90,000*	717†	.....	....	...	Freon	¼	870	7½	1,500	....	140,000‡	...	99 x 43 x 17
92V	693.00	840	405§	.....	.....	128,000*	947†	.....	....	...	Freon	½	720	9	2,500	....	208,000‡	...	115 x 47 x 23
93V	855.00	1,050	510§	.....	.....	167,240*	1,275†	.....	....	...	Freon	½	720	9	3,700	....	312,000‡	...	116 x 69 x 23
94V	989.00	1,506	750§	.....	.....	220,500*	1,315†	.....	....	...	Freon	1	720	9	5,000	....	388,000‡	...	116 x 85 x 35
122V	989.00	1,470	750§	.....	.....	220,560*	1,420†	.....	....	...	Freon	1	750	12	6,200	....	388,000‡	...	120 x 61 x 30
123V	1,170.00	2,280	1,125§	.....	.....	315,120*	1,690†	.....	....	...	Freon	1½	680	12	8,200	....	556,000‡	...	120 x 86 x 30
124V	1,290.00	2,280	1,125§	.....	.....	408,880*	1,845†	.....	....	...	Freon	2	720	12	10,500	....	708,000‡	...	120 x 110 x 30

§Cost of heating coil added. * Maximum capacities 6-row coil—capacity reduced with reduced number of coils. †Weight of unit with smallest coil—unit with larger coils proportionately heavier. ‡Maximum capacities 3-row coil—capacity reduced with number of coils.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Floor Type																			
G	$225.00	250	148	.....	.....	23,400*	....	.....	....	...	.....	1/20	850	6	500	....	38,000†	...	30 x 38 x 13
H	215.00	160	135	.....	.....	23,500*	....	.....	....	...	.....	1/20	1,140	4½	500	....	47,000†	...	40 x 27 x 13
M	310.00	244	210	.....	.....	31,700*	....	.....	....	...	.....	1/10	850	6	900	....	63,000†	...	49 x 30 x 13
N	380.00	500	405	.....	.....	60,500*	....	.....	....	...	.....	⅛	850	7½	1,300	....	120,000†	...	63 x 32 x 15
O	455.00	616	465	.....	.....	62,600*	....	.....	....	...	.....	⅛	850	7½	1,500	....	124,000†	...	69 x 32 x 15
P	500.00	780	600	.....	.....	81,700*	....	.....	....	...	.....	½	850	9	1,800	....	162,000†	...	73 x 38 x 19

*Maximum capacities 4-row coil—capacity reduced with reduced number of coils. †Maximum capacities 3-row coil—capacity reduced with reduced number of coils.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Suspended Type																			
12	$140.00	104	...	.....	.....	17,300*	120†	.....	....	...	Freon	1/30	1,140	12	500	....	.....	...	15 x 20 x 23
16	325.00	226	...	.....	.....	29,000*	200†	.....	....	...	Freon	1/20	850	16	800	....	.....	...	19½ x 25 x 23
21	395.00	330	...	.....	.....	67,000*	240†	.....	....	...	Freon	1/10	850	21	1,500	....	.....	...	24½ x 29 x 23

*Maximum capacities 4-row coil—capacity reduced with reduced number of coils. †Weight of unit with smallest coil, unit with larger coils proportionately heavier.

COMMERCIAL MACHINE SPECIFICATIONS TO APPEAR IN APRIL 3 ISSUE

AIR CONDITIONING

How to Figure Total Heat Load For Air-Conditioning Jobs

CHICAGO—Methods of figuring the heat load for an air-conditioning installation in a restaurant are explained in lesson No. 6 of the air-conditioning home study course prepared by the Refrigeration and Air Conditioning Institute, 2130 Lawrence Ave., Chicago, Ill. The lesson also explains applications in which evaporative cooling can be employed. This article picks up from a previous lesson in which instructions were given for figuring the heat load brought about by the introduction of fresh air as a function of the restaurant air-conditioning installation.

The Occupancy Load

We have figured on a peak occupancy for the 40 seats at the tables as being 32 people, and for the 100 counter seats we have counted on a peak of 110 people with an extra 10 standing while waiting for seats or while entering and leaving the room.

So we count a peak of 142 people and consider them as being at rest which means a heat dissipation of 400 B.t.u.'s per hour per person, or a total of 56,800 B.t.u.'s.

We will have to consider the 20 employees who may be considered as doing medium hard work during the peak load period and as dissipating 600 B.t.u.'s per hour per person or a total of 12,000 B.t.u.'s for employees. Our occupancy load then turns out to be

142 customers....56,800 B.t.u.'s per hour
20 employees ...12,000 B.t.u.'s per hour

Total .....68,800 B.t.u.'s per hour

The total load for exposure, sunlight and ventilation was found to be 63,753 B.t.u.'s per hour and now we find the human load alone amounts to more than the total for all the rest we have calculated up to this point. Such a condition is quite common in places where a great many people gather in a fairly small space.

Figuring on Employees

We have figured the human load quite liberally in this case because at least half the employee load will not be in the dining room but in the kitchen, this being true because even those employees serving in the dining room will also be in the kitchen part of their time. Since it is not our idea to build up a total load any larger than really necessary, it will be wise to count on only half the employed load or on 6,000 B.t.u.'s.

This will reduce our total human load to 62,800 B.t.u.'s which is a better figure to use . The rate of 400 B.t.u.'s per person for the customers is plenty high for this class of service and really gives us a good factor of safety. We are using the 400 B.t.u. rate because it is one generally accepted in air-conditioning calculations.

The Moisture Load

In counting on the moisture load or evaporation load we allow nothing for the people present because the latent heat from this source has been included with the regular occupancy load. However, in this restaurant, we have four coffee urns and a steam table.

The coffee urns are of 8-gallon capacity each or a total of 32 gallons. Since they are provided with hoods we can figure a heat rate equivalent to 1/5 cu. ft. of gas per hour per gallon, or 6.4 cu. ft. of gas for all the urns.

We find the gas is of the natural variety for which we figure 1,000 B.t.u.'s per 1,000 cu. ft. Therefore the moisture load for the urns is only 6.4 B.t.u.'s per hour and is not worth considering. Had the urns been without hoods this would be five times as great.

Steam Table Data

We have a steam table with a top 2½ by 10 ft., or an area of 25 sq. ft., which is insulated. We learned to figure 110 B.t.u.'s per square foot per hour for an insulated steam table, so here we have 2,750 B.t.u.'s as a heat load.

We do not know the moisture evaporated from this table, but since its total heat load of 2,750 B.t.u.'s will be included under light and power we will add nothing for moisture. You will find it to be a general rule that when the total of other heat loads in a place is large and when there are only a few things which may cause small moisture loads you can safely forget the moisture load altogether—and that is what we shall do in the case of this restaurant.

The Light and Power Load

Our light and power load will include the coffee urns, the steam table and the electric lamps. We found no motors or other heat producing devices in the dining room we are working with. The load for the coffee urns is so small it may be omitted, this being because they are fitted with hoods. We have already calculated the steam table heat load as 2,750 B.t.u.'s per hour.

There are 20 lamps of 100 watts each, which makes a total of 2,000 watts. For a load of this kind we figure 3.4 B.t.u.'s per hour per watt, so for our 2,000 watts we would have a load of 6,800 B.t.u.'s in the lamps.

But here we must remember that a sunlight load has already been counted on and that not all the lamps will be lighted during the hours of bright sunlight. If you look back at the calculations for exposure and sunlight loads for the south wall, the west wall and the ceiling and roof you will find them totaling an amount greater than the electric lamp load. Therefore, were no lamps to be lighted except during the hours when there is no sunlight, such as in the evening, we would retain the sunlight load and omit the lighting load because the amount of sunlight is the greater of the two.

Daylight Lamp Load

An examination of the conditions inside this restaurant shows we have a north wall and an east wall without any windows, and that we have no great amount of window surface on a large portion of the west wall. It appears likely that there is a possibility of half the lamps being lighted even during sunlight hours and so we must count in half our lamp load in addition to the sunlight load, or must count a lamp load of 3,400 B.t.u.'s per hour.

Adding the 2,750 B.t.u.'s for the steam table to this lamp load gives us a total light and power load of 6,150 B.t.u.'s per hour. It is worth while noting that had the steam table been uninsulated we would have allowed 550 B.t.u.'s per square foot of top surface which would make the steam table load come to 13,750 B.t.u.'s instead of 2,750 B.t.u.'s allowed by the insulated top.

The Total Heat Load

Now we have made all our calculations for the various kinds of heat load to be found in this restaurant job, so let's add them all together and find what size cooling plant it dequired. Here is our list:

Exposure and Sunlight	
Outside walls	7,611 B.t.u.
Partition walls	6,480 B.t.u.
Floor	4,500 B.t.u.
Ceiling	12,600 B.t.u.
Total	**31,191 B.t.u.**
Ventilation, Leakage	
Total	**32,562 B.t.u.**
Occupancy or Human	
Customers	56,800 B.t.u.
Employees	6,000 B.t.u.
Total	**62,800 B.t.u.**
Moisture (None Allowed)	
Light and Power	
Lamps (½ load)	3,400 B.t.u.
Steam table	2,750 B.t.u.
Total	**6,150 B.t.u.**
Total of All Heat Loads	**132,703 B.t.u.**

Some engineers would now add an amount equal to about 10 per cent of the total as a factor of safety in making sure that the conditioning plant would meet the conditions required by the owner. If you are going to absolutely guarantee a certain performance it might be advisable to add this 10 per cent and count on a total load of 145,973 B.t.u.'s for the job, or in round numbers to count on 146,000 B.t.u.'s per hour.

Rating of Equipment

Cooling equipment generally is rated according to its ability in "tons of refrigeration" which means the equivalent ability in tons of melted ice. Ice has a latent heat of fusion of 144 B.t.u.'s per pound. The word fusion means the same as melting or turning to a liquid, so this expression means a pound of ice will absorb 144 B.t.u.'s as it changes to water at the same temperature as the ice or at 32°.

There are 2,000 pounds to a ton and since one pound of ice absorbs 144 B.t.u.'s of heat as it melts, 2,000 pounds will absorb 288,000 B.t.u.'s. This amount of heat, 288,000 B.t.u.'s, is called one ton of refrigeration because it is equivalent of melting one ton of ice.

This value is based on melting the ton of ice in one day of 24 hours, this element of time making our ton of refrigeration into a rate of cooling or a rate of refrigeration. If we divide the 288,000 B.t.u.'s by 24 (hours) we have one ton of refrigeration as representing 12,000 B.t.u.'s per hour. This last figure is a figure you should remember because it is so often used.

In handling the restaurant job we want a cooling rate of 132,702 B.t.u.'s per hour. We divide this amount by 12,000 B.t.u.'s and thus find we need a capacity of 11.06 tons of refrigeration or approximately 11 tons.

Were we to use the 10 per cent factor of safety we would have 146,000 B.t.u.'s per hour which would call for a refrigerating capacity of about 12.17 tons and we probably would figure on 12 tons even. Knowing the refrigeration load or cooling load to be carried we can go ahead and pick out a refrigerating unit of this capacity and also pick out the evaporators or cooling coils having the same capacity. In selecting the cooling coil units we will also have to know how many cubic feet of air per minute must be handled since this value will affect the size of our coolers.

The Effect of Humidity on Cooling Requirements

The proportions of the total load which are furnished by the various separate loads in the example we just worked out are quite typical of this class of restaurant work, and therefore are representative of much of our work in general since restaurants are among the great users of air conditioning.

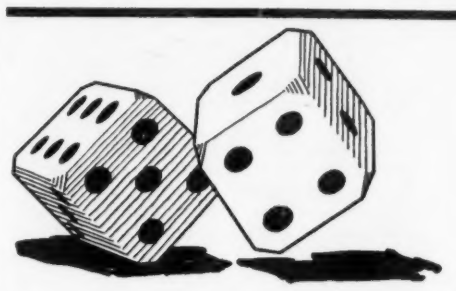
In this particular case we have the exposure and sunlight load representing about 23.5 per cent of the total, the ventilation load accounting for about 24.5 per cent, the occupancy load coming to about 47.5 per cent, and the light and power accounting for the remainder of about 4.5 per cent.

Must Calculate Accurately

Because of all these except the light and power load for large portions of the total it is important to figure them accurately, and important to make certain we are working with the correct factors. Any apparently slight change or any misunderstanding of the conditions to be provided may throw the equipment badly out of balance.

In the example worked out we figured on maintaining a 50 per cent

(*Continued on Page 17, Column 1*)



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Commonwealth Brass Fittings for connecting tubing are made in every size, shape and style required by the industry.

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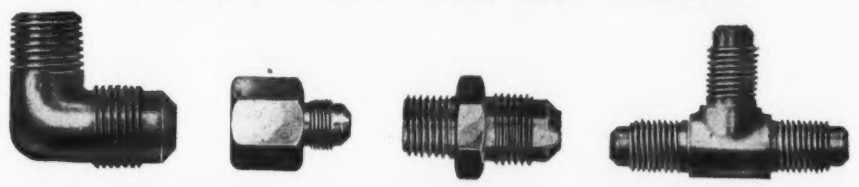

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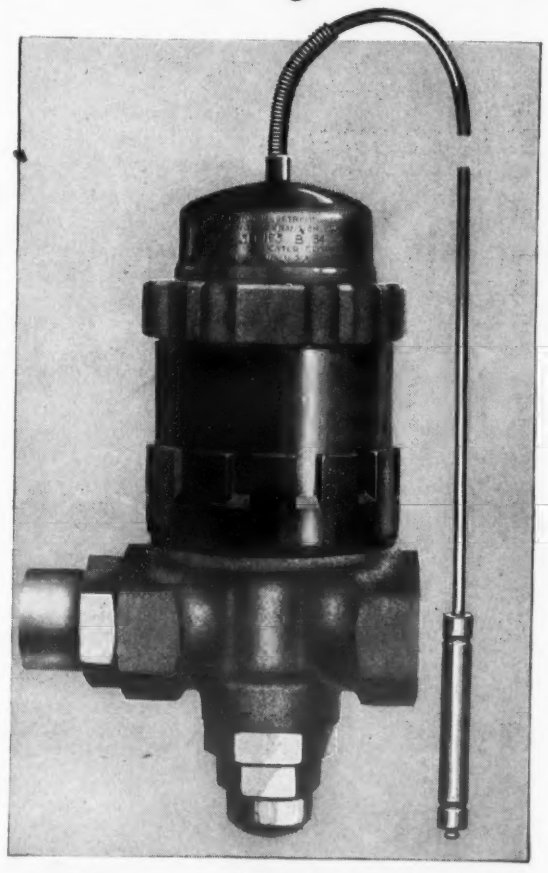
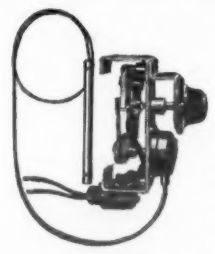
THERMOSTATIC EXPANSION VALVE No. 785

The No. 785 has a capacity of 12 tons on Freon or Sulphur Dioxide and 24 tons on Methyl Chloride. Needle and seat are both Delubaloy for maximum resistance to wear and corrosion. The valve is self-aligning and entirely free from side thrust. Both needle and strainer assemblies are easily accessible for inspection and cleaning.



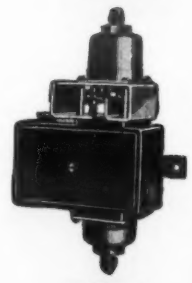


"GENUINE DETROIT"
CABINET THERMOSTAT
No. 261

This is a high voltage thermostat entirely concealed in the cabinet of a room cooler or space heater. The bulb is located in the stream of incoming air. Only the knob and dial on outside of cabinet.

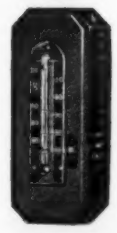
"GENUINE DETROIT"
HUMIDISTAT No. 697

A low voltage control which accurately regulates air moisture. It is used in conjunction with a Solenoid or electric water valve. The circuit is made on dry air and broken on moist air.



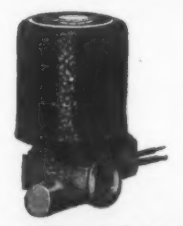
"GENUINE DETROIT"
CONTROL SWITCH
No. 250

This unit is furnished in several models for the control of low side pressures, air, water or brine temperatures or any combination of temperatures and pressures.



"GENUINE DETROIT"
ROOM THERMOSTAT
No. 444

Thermostat No. 444 controls air temperature for heating or cooling or both. It is a sensitive low voltage instrument which incorporates the bi-metal principle.



"GENUINE DETROIT"
SOLENOID VALVE
No. 683-R

This is a large capacity unit having great lifting power, which controls flow of water or refrigerant in air conditioning or general refrigeration work. It may be used in installations employing Methyl Chloride, Sulphur Dioxide or Freon.

"GENUINE DETROIT"
THERMOSTATIC EXPANSION VALVE
No. 674

This is a non-adjustable single purpose valve exceptionally well suited to factory assembled refrigerators produced in large volume. It keeps the evaporator completely refrigerated, pressures varying with the evaporator temperature as in the flooded type evaporator.

DETROIT LUBRICATOR COMPANY
DETROIT, MICHIGAN, U. S. A.
DIVISION OF AMERICAN RADIATOR AND STANDARD SANITARY CORPORATION

Thermal Units

Thermal Units Mfg. Co.
Chicago, Ill.

Functions—Self-contained models: cooling, dehumidifying, and cleaning; heating and humidifying optional. Remote floor-type units: cooling, dehumidifying, and cleaning; heating and humidifying optional. Suspended type: cooling, dehumidifying, and heating; humidifying and cleaning optional.

Cabinet—Thermal Units cabinet. Self-contained models finished in walnut, remote floor-type cabinets in burled walnut, suspended-type models finished in aluminum.

Compressor—Thermal eight-cylinder compressor for models 50, 100, and 150 in self-contained series; 12-cylinder compressor for other models in self-contained series. Cutler-Hammer motor starter, Minneapolis-Honeywell high side safety cut-out.

Blower—Models 50, 100, and 150 of self-contained series, squirrel-cage type, belt driven; other self-contained models use a direct-driven Thermal Units blower; remote floor-type models use Torrington wheels, direct driven; suspended-type models use Thermal Units 4-blade propeller type, direct driven.

Air Circulation—Air intake in sides on self-contained and remote floor-type models; in rear on suspended-type models. Air discharge in top on self-contained and remote floor-type models; in front on suspended-type models. Uniflo discharge grilles.

Cooling System — Self-contained models, direct expansion only. Others direct expansion or cold water. Thermal Units aluminum cooling coils.

Heating System—Thermal Units aluminum heating coils. Can be used with hot water if desired.

Air Cleaning Medium—Filter.

Type of Humidifier—Spray nozzle type.

Controls — Self-contained models: thermostatic expansion valve, humidistat, water regulating valve. Remote floor-type cabinets: thermostatic expansion valve, humidistat. Suspended-type: thermostatic expansion valve, humidistat, thermostat, liquid line solenoid valve.

Model No.	Price	Surfaces Cool	Sq. Ft. Heat	Refrigeration Capacity: Dehumidification	Refrigeration Capacity: Sensible Heat	Refrigeration Capacity: Total	Net Weight	Compressor: Bore & Stroke	Compressor: Speed (R.p.m.)	Compressor: Motor Hp.	Compressor: Refrigerant	Blower: Motor Hp.	Blower: Speed R.p.m.	Blower: Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained Floor Type																			
50	$295.00	50	50	1800	4200	6,000	.....	9/16 x 7/8	1750	½	Freon	†	‡	7 x 3	300	450	18,000	10	35 x 31 x 15¼
100	440.00	100	100	3600	8400	12,000	.....	13/16 x 1-1/10	1150	1	Freon	†	‡	9 x 4½	400	600	36,000	15	40 x 35 x 20
150	490.00	165	165	5400	12600	18,000	.....	13/16 x 1-1/10	1750	1½	Freon	†	‡	9 x 4½	600	600	54,000	18	49 x 41 x 20
300	750.00	330	330	10800	25200	36,000	.....	15/16 x 1-3/4	1150	3	Freon	⅛	‡	15	2,000	600	108,000	24	84 x 51 x 21
500	1,150.00	525	525	18000	42000	60,000	.....	15/16 x 1-3/4	1750	5	Freon	¼	‡	15	2,500	600	180,000	32	100 x 51 x 21
†None used. ‡Variable at will.																			
Remote Floor Type																			
5	$140.00	50	50	1800	4200	6,000	.....	.....	....	...	.....	1/20	‡	7 x 3	300	450	18,000	10	30 x 31 x 15¼
7	160.00	75	75	2700	6300	9,000	.....	.....	....	...	.....	1/10	‡	9 x 4½	400	600	27,000	10	35 x 35 x 20
10	175.00	100	100	3600	8400	12,000	.....	.....	....	...	.....	⅛	‡	9 x 4½	450	600	36,000	15	44 x 41 x 20
15	195.00	165	165	5400	12600	18,000	.....	.....	....	...	.....	⅛	‡	9 x 4½	600	600	54,000	18	49 x 41 x 20
20	225.00	210	210	10800	25200	24,000	.....	.....	....	...	.....	⅓	‡	(2) 9 x 4½	750	600	72,000	18	49 x 45 x 20
30	275.00	330	330	18000	42000	36,000	.....	.....	....	...	.....	⅓	‡	(2) 9 x 4½	1,000	600	108,000	24	60 x 45 x 24
‡Variable with four speed controllers.																			
Suspended Type																			
DE12	$125.00	42	42	2592	6048	8,640	150	.....	....	...	.....	1/10	1,750	12	975	975	41,300	50	15 x 21¼ x 28
DE16	148.00	70	70	4608	10752	15,360	215	.....	....	...	.....	⅛	1,150	15½	1,740	1,020	73,100	70	19 x 25¼ x 31
DE20	205.00	145	145	7200	16800	24,000	275	.....	....	...	.....	⅛	1,150	19	2,710	970	136,100	190	22¾ x 29¼ x 31
DE24	265.00	168	168	11472	26768	38,240	360	.....	....	...	.....	¼	1,150	22	4,320	1,080	195,600	190	27 x 34 x 31½
DE30	340.00	245	245	15200	35200	50,400	470	.....	....	...	.....	½	1,150	24	5,700	980	285,300	190	33 x 37½ x 32

Capacities of above models when using cold water: model DE12, 10,800 B.t.u.'s; model DE16, 19,200; model DE20, 30,000; model DE24, 47,800; model DE30, 63,000. Water flow in gallons per minute: model DE12, 6; model LE16, 9; model DE20, 15; model DE24, 24; model DE30, 30.

Trane

The Trane Co., LaCrosse, Wis.

Functions—Cooling, dehumidifying, and heating. Humidifying and cleaning optional.

Cabinet—Remote floor type and suspended type (in series 205 to 212)—Trane cabinet of furniture steel, finished in dark brown krinkle. Suspended type (in series 2103-4112) and duct type—Trane sheet metal cabinet finished in baked silver enamel or gray priming coat if desired.

Blower — Trane forward-curved multi-blade blower.

Air Circulation—Remote floor-type units and suspended-type units (series 205 to 212)—air intake in front at bottom of unit; air discharge in top face of unit; fresh air intake optional. Duct type and suspended type (series 2103 to 4112)—intake in back of unit, discharge in front of unit; fresh air intake optional. Trane "Freeflo" grilles (for suspended and duct-type units, diffusers or nozzle outlets can be furnished).

Cooling System—Direct expansion or cold water. Trane copper coils.

Heating System—Trane steam coils. Hot water can be used if cold water is used for cooling.

Air Cleaning Medium—Trane copper wool filter.

Controls—Thermostatic expansion valve, thermostat, humidistat, liquid line solenoid valve, water regulating valve.

Model No.	Price	Surfaces Cool	Sq. Ft. Heat	Refrigeration Capacity: Dehumidification	Refrigeration Capacity: Sensible Heat	Refrigeration Capacity: Total	Shipping Weight	Compressor: Bore & Stroke	Compressor: Speed (R.p.m.)	Compressor: Motor Hp.	Compressor: Refrigerant	Blower: Motor Hp.	Blower: Speed R.p.m.	Blower: Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Remote Floor Type																			
Series 52 to..	$150 to	...	...	.....	.....	7,950 to	....	.....	....	...	Optional	1/30 to	850	4½ to	300 to	....	.....	...	.....
122	$512.00	...	...	.....	.....	84,000	....	.....	....	...	Optional	½	...	10	2,500	....	.....	...	.....
Suspended Type																			
Series 205 to.	$148.50 to	...	...	.....	.....	7,950 to	....	.....	....	...	Optional	1/30 to	850	4½ to	300 to	....	.....	...	.....
212	$586.25	...	...	.....	.....	91,600	....	.....	....	...	Optional	½	...	10	2,500	....	.....	...	.....
Series 2103 to	$402.00 to	...	...	.....	.....	53,000 to	....	.....	....	...	Optional	½ to	438 to	10 to	3,000 to	....	.....	...	.....
4112	$915.00	...	...	.....	.....	284,000	....	.....	....	...	Optional	2	927	15	12,000	....	.....	...	.....
Duct Type																			
Series 2203 to	$402.00 to	...	...	.....	.....	53,000 to	....	.....	....	...	.....	½ to	500 to	10 to	3,000 to	....	.....	...	.....
4212	$915.00	...	...	.....	.....	284,000	....	.....	....	...	.....	2	695	15	12,000	....	.....	...	.....

Zephyr Air

Savage Arms Corp.
New York, N. Y.

Functions—Cooling, dehumidifying, heating, humidifying, cleaning—all models.

Blower—Aluminum blower wheel.
Cooling System—Direct expansion or cold water.

Type of Humidifier—Air washing in all models.

Air Cleaning Medium—Air washing and scrubber plates.

Model No.	Price	Surfaces Cool	Sq. Ft. Heat	Refrigeration Capacity: Dehumidification	Refrigeration Capacity: Sensible Heat	Refrigeration Capacity: Total	Net Weight	Compressor: Bore & Stroke	Compressor: Speed (R.p.m.)	Compressor: Motor Hp.	Compressor: Refrigerant	Blower: Motor Hp.	Blower: Speed R.p.m.	Blower: Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Remote Floor Type																			
61	$.....	...	...	.....	.....	9,000	....	.....	....	...	Freon	....	...	...	250	....	.....	6	.....
85	.....	...	...	.....	.....	15,000	....	.....	....	...	Freon	....	...	...	500	....	.....	12	.....
Self-Contained Floor Type																			
60	$.....	...	...	.....	.....	9,000	....	.....	....	...	Freon	....	...	...	250	....	.....	6	.....
Duct Type																			
86	$.....	...	...	.....	.....	30,000	....	.....	....	...	Freon	....	...	...	1,000	....	.....	24	.....
88	.....	...	...	.....	.....	60,000	....	.....	....	...	Freon	....	...	...	2,000	....	.....	48	.....
90	.....	...	...	.....	.....	120,000	....	.....	....	...	Freon	....	...	...	4,000	....	.....	96	.....

Clarage

Clarage Fan Co.
Kalamazoo, Mich.

Functions—Cooling, dehumidifying, heating, humidifying, and cleaning, all models.

Blower—Clarage multiblade blower, belt driven.

Air Circulation—Air intake and discharge in top in floor-type duct units. Air intake and discharge in ends on suspended-type units. Fresh air intake optional.

Cooling System—Direct expansion or cold water. Trane or Aerofin copper coils.

Heating System—Steam or hot water. Aerofin copper heating coils.

Air Cleaning Medium—Owens-Illinois filter.

Humidifier—Spray type humidifier.

Model No.	Price	Surfaces Cool	Sq. Ft. Heat	Refrigeration Capacity: Dehumidification	Refrigeration Capacity: Sensible Heat	Refrigeration Capacity: Total	Net Weight	Compressor: Bore & Stroke	Compressor: Speed (R.p.m.)	Compressor: Motor Hp.	Compressor: Refrigerant	Blower: Motor Hp.	Blower: Speed R.p.m.	Blower: Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Duct Type																			
44	$.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	14⅝	*	....	.....	...	60 x 54¼ x 51¼
46	.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	(2) 13	*	....	.....	...	60 x 74¼ x 51¼
48	.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	(2) 16¼	*	....	.....	...	60 x 94¼ x 51¼
58	.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	(2) 17⅞	*	....	.....	...	60 x 94¼ x 63¼
*Model 44—1300 to 2830 c.f.m.; model 46—1945 to 4240 c.f.m.; model 48—2600 to 5670; model 58—4160 to 9070.																			
Suspended Type																			
440	$.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	14⅝	*	....	.....	...	35⅛ x 46¾ x 64⅛
460	.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	(2) 13	*	....	.....	...	35⅛ x 66¾ x 64⅛
480	.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	(2) 16¼	*	....	.....	...	35⅛ x 86¾ x 64⅛
580	.....	...	...	.....	.....	.....	....	.....	....	...	.....	....	...	(2) 17⅞	*	....	.....	...	40⅝ x 86¾ x 66⅛
Model 440—1300 to 2830 c.f.m.; model 460—1945 to 4240 c.f.m.; model 480—2600 to 5670; model 580—4160 to 9070.																			

King Zeero

King Zeero Co., Chicago, Ill.

Functions—Cooling and dehumidifying. Cleaning optional.

Cabinet—King Zeero all-steel welded cabinet, enamel finish, nickel trimmed.

Blower—King Zeero fan unit, direct driven.

Air Circulation—Air intake in back of cabinet, discharge in front. King Zeero steel grilles.

Air cleaning—Spray type, with or without pump.

Heating System—Cold water coils can be used with hot water for heating.

Cooling System—Direct expansion, brine or cold water. King Zeero spiral fin steel coils.

Controls—Expansion valve or float valve. Thermostat extra equipment.

Model No.	Price	Surfaces Cool	Sq. Ft. Heat	Refrigeration Capacity: Dehumidification	Refrigeration Capacity: Sensible Heat	Refrigeration Capacity: Total	Shipping Weight	Compressor: Bore & Stroke	Compressor: Speed (R.p.m.)	Compressor: Motor Hp.	Compressor: Refrigerant	Blower: Motor Hp.	Blower: Speed R.p.m.	Blower: Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Remote Floor Type																			
9-M	$210.00	40	...	.....	.....	9,000	140	.....	....	...	Any	1/30	1,140	12	†	...	.....	...	35 x 22 x 22
12-M	240.00	53	...	.....	.....	12,000	160	.....	....	...	Any	1/30	1,140	12	†	...	.....	...	37 x 22 x 24
18-M	280.00	75	...	.....	.....	18,000	175	.....	....	...	Any	1/10	1,140	16	†	...	.....	...	43 x 22 x 24
24-M	320.00	100	...	.....	.....	24,000	200	.....	....	...	Any	1/10	1,140	16	†	...	.....	...	49 x 25 x 28
†1,000 c.f.m. to 2,300 c.f.m.																			

COMING: "HOW TO SELL ELECTRIC REFRIGERATION"—APRIL 10 ISSUE

AIR CONDITIONING

How to Figure Heat Loads Under Various Types of Conditions

(*Continued from Page 15, Column 3*)

relative humidity inside the building when the outdoor relative humidity is 50 per cent. In many locations we might have a lower outdoor humidity during the warm months and in some places we might have a higher humidity to contend with.

We worked out the ventilation load from the outdoor and indoor dry bulb temperatures and relative humidities with the help of our curve showing the total heat in air and the other curves showing how the air volume changes with dry bulb temperature. Now we shall assume that instead of an outdoor humidity of 50 per cent as originally assumed we will have a humidity of 60 per cent.

For an outdoor dry bulb temperature of 95° and a relative humidity of 60 per cent the psychrometric chart tells us the wet bulb temperature will be 82.5°. The curve for total heat shows that a wet bulb temperature of 82.5° corresponds to 45.0 B.t.u.'s per pound of air. With our indoor condition of 80° dry bulb temperature and 50 per cent relative humidity we will have 31.0 B.t.u.'s per pound of air—this being the value we arrived at in our earlier work.

Cubic Feet in Pound of Air

Now we want to learn the number of cubic feet in a pound of air under these two conditions. On the curve showing air volume changes we find for a dry bulb temperature of 95° the volume of a pound of saturated air is 14.8 cu. ft. and that for a pound of dry air is 14.0 cu. ft. The difference is 0.8 cu. ft. for 100 per cent saturation or 100 per cent relative humidity. But we have only 60 per cent relative humidity so we take 60 per cent of 0.8 which is 0.48 and add this to the volume for dry air to find the volume of one pound of air at 95° and 60 per cent relative humidity is 14.48 cu. ft.

Then for the indoor condition, we find for a dry bulb temperature of 80° the volume of a pound of saturated air is 14.06 cu. ft. and the volume for a pound of dry air is 13.60 cu. ft. The difference is 0.46 and for 50 per cent relative humidity we take half this amount or 0.23 and add it to the value for dry air (13.60) to find a volume of 13.83 cu. ft. per pound at the indoor conditions.

For the outdoor conditions we have 45.0 B.t.u.'s per pound which is 14.48 cu. ft. This amounts to 3.11 B.t.u.'s per cu. ft. Indoors we have 31.0 B.t.u.'s per pound or per 13.83 cu. ft., and this amounts to 2.24 ft. per pound. Then the difference in heat per pound of air brought in from outdoors and per pound of conditioned air will be the difference between these figures or will be 0.87 B.t.u.'s per cu. ft.

Ventilation Load

In our restaurant job we were going to bring in 810 cu. ft. of outside air per minute or 48,600 cu. ft. per hour. We must extract 0.87 B.t.u.'s from each cu. ft., and from this total volume of air must remove 42,282 B.t.u.'s. This will be our venilation load when we change the outdoor relative humidity from 50 per cent to 60 per cent. Our original ventilation load with an outdoor humidity of 50 per cent was 32,562 B.t.u.'s. For the change of 10 per cent in indoor relative humidity, without any change in outdoor temperature, we must have an extra cooling capacity of 9,720 B.t.u.'s per hour or somewhat more than an additional three-quarter ton of refrigeration.

Here is a list of cities with their average relative humidities which would occur with those maximum dry bulb temperatures and the accompanying wet bulb temperatures:

Average Summer Relative Humidities

Atlanta, Ga.	48
Atlantic City, N. J.	64
Baltimore, Md.	46
Birmingham, Ala.	49
Bismarck, N. D.	38
Boston, Mass.	50
Buffalo, N. Y.	60
Burlington, Vt.	50
Charleston, S. C.	55
Chicago, Ill.	50
Cincinnati, Ohio	43
Cleveland, Ohio	49
Dallas, Texas	35
Dayton, Ohio	42
Denver, Colo.	22
Des Moines, Ia.	43
Detroit, Mich.	46
Fort Worth, Texas	40
Indianapolis, Ind.	45
Kansas City, Mo.	46
Lincoln, Neb.	41
Los Angeles, Cal.	41
Louisville, Ky.	42
Madison, Wis.	47
Memphis, Tenn.	49
Miami, Fla.	64
Milwaukee, Wis.	49
Minneapolis, Minn.	57
New Orleans, La.	52
New York, N. Y.	48
Peoria, Ill.	48
Philadelphia, Pa.	46
Phoenix, Ariz.	23
Pittsburgh, Pa.	43
Portland, Me.	50
Portland, Ore.	38
Richmond, Va.	42
St. Louis, Mo.	46
San Francisco, Cal.	42
San Antonio, Texas	38
Salt Lake City, Utah	22
Seattle, Wash.	27
Spokane, Wash.	22
Tampa, .Fla.	52
Trenton, N. J.	43
Washington, D. C.	46
Wilmington, N. C.	55

Evaporative Cooling

As you would imagine, there are various methods which we may use in controlling the temperature and the relative humidity of air. Sometimes one method will be best for a given job and again some other system will be best—it all depends on the particular conditions we are working with. There is one very interesting method which appears at first sight to be almost an impossibility—much like the old saying about lifting yourself with your boot straps. This method is called evaporative cooling.

You will find that evaporative cooling is very limited in its application because it will be successful only in localities where we have a low outdoor relative humidity along with the high temperature. By looking in the table I just gave you it will appear there are some such places, such for example as Dallas, Texas, where we have an average high temperature of 99°, but have an accompanying wet bulb temperature of 76° and a corresponding relative humidity of 35 per cent.

What It Depends On

This evaporative cooling depends on the fact that you may have many different combinations of dry bulb temperature and relative humidity with the same wet bulb temperature and with the same total heat in the air. You will recall that the total heat, or the sum of the latent and sensible heats remains the same as long as we have a given wet bulb temperature. Taking the example of Dallas with its wet bulb temperature of 76°, we find from the curve that this means a total heat of 38.6 B.t.u.'s per pound of air.

If we go to our psychrometric chart and follow along the slanting line for 76° wet bulb temperature we can make the following list of dry bulb temperatures and relative humidities, all of which correspond to 76° wet bulb temperature and to a total heat of 38.6 B.t.u.'s per pound of air.

76° dry bulb—100 % relative humidity
80° dry bulb— 84 % relative humidity
85° dry bulb— 67 % relative humidity
90° dry bulb— 53 % relative humidity
95° dry bulb— 42½% relative humidity
100° dry bulb— 34 % relative humidity
105° dry bulb— 27 % relative humidity
110° dry bulb— 21 % relative humidity

The sensible heat increases as the dry bulb temperature increases. Since the total heat remains unchanged with all these combinations it must be true that the latent heat decreases as the dry bulb temperature increases.

Now go back to our curves of equal comfort in temperature and humidity and notice where, on the graph, these various combinations of dry bulb temperature and relaitve humidity fall with reference to the comfort zone. You will find that the high temperature combinations, such as 105° and 27 per cent relative humidity, fall away outside the farthest limits of the comfort zone, but that the lower temperature combinations come closer and closer to that zone in spite of the fact we are not changing the total heat in the air.

Comfort Zone Range

By the time you get to the combination of 85° and 67 per cent relative humidity you will come very close to being within the outside limit of the comfort zone. Thus it appears that a reduction of dry bulb temperature, even though we have to raise the relative humidity to some extent, will give us less discomfort while we keep the total heat the same as before. This is exactly what is accomplished by evaporative cooling.

The difference between the outdoor dry bulb temperature and wet bulb temperature is called the "wet bulb depression." The greater the wet bulb depression the lower will be the relative humidity. In our example for Dallas the wet bulb depression is the difference between 99° dry bulb and 76° wet bulb, or is 23°. The success of evaporative cooling or its efficiency in promoting comfort depends on having a large wet bulb depression. To give you an idea of how the wet bulb depression varies here is a list of our cities with their wet bulb depressions:

10°—Atlantic City, N. J.
11°—Miami, Fla.; Buffalo, N. Y.
12°—Minneapolis, Minn.
14°—Portland, Me.; Wilmington, N. C.; Charleston, S. C.; Burlington, Vt.
15°—Milwaukee, Wis.; Chicago, Ill.; Tampa, Fla.; New Orleans, La.; Boston, Mass.; Cleveland, Ohio.
16°—Birmingham, Ala.; Atlanta, Ga.; Peoria, Ill.; Detroit, Mich.; New York, N. Y.; Memphis, Tenn.; Madison, Wis.
17°—San Francisco, Calif.; Washington, D. C.; Indianapolis, Ind.; Baltimore, Md.; Kansas City, Mo.; St. Louis, Mo.; Philadephia, Pa.
18°—Los Angeles, Calif.; Des Moines, Iowa; Trenton, N. J.; Cincinnati, Ohio; Portland, Ore.; Pittsburgh, Pa.; Salt Lake City, Utah.
19°—Louisville, Ky.; Lincoln, Neb.; Bismarck, N. D.; Richmond, Va.; Dayton, Ohio.
20°—Fort Worth, Texas.
22°—San Antonio, Texas; Seattle, Wash.
23°—Dallas, Texas.
26°—Denver, Colo.; Spokane, Wash.

From this list you can see that the regions of greatest wet bulb depression are not those most thickly populated and they do not contain very many of the larger cities. Consequently, evaporative cooling is not one of the most important methods used in air conditioning. You should remember in looking over this list of wet bulb depressions that they represent only average conditions at the average high temperatures and relative humidities we have been using. Conditions will vary from day to day and even in places where evaporative cooling might be rather ineffective during some periods it would work very well at other times.

Evaporative cooling is accomplished by drawing the relatively dry but hot outdoor air into contact with water. The heat of the air evaporates the water, or some of the water. The latent heat of evaporation is taken from the air. The dry bulb temperature falls as the air loses sensible heat, and the evaporated moisture enters the air to increase its relative humidity.

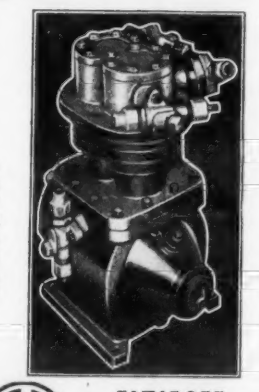
If the air is completely saturated

(*Concluded on Page 19, Column 1*)

BARE COMPRESSORS

ATTENTION SERVICE COMPANIES and ASSEMBLERS

Write for our Special Plans and learn how you can enjoy "M&E" prestige and proven quality in your private label work. We offer a complete range of COMMERCIAL AND DOMESTIC BARE COMPRESSORS



CATALOGS ON REQUEST

Merchant & Evans Co.
MANUFACTURERS
PHILADELPHIA
EST. 1866 · · Plant, LANCASTER, PA.

THEY COST NO MORE

HERE'S what you get in Minneapolis-Honeywell Refrigeration Controls: (1) Broad range; (2) Close differential; (3) Visible scales; (4) Simple design; (5) Rugged construction; (6) Con-Tac-Tor mercury switching. Yet with all these advantages, Minneapolis-Honeywell Refrigeration Controls cost no more. They are available in any desired temperature or pressure range and are suitable for all types of commercial or air conditioning applications. Minneapolis-Honeywell Regulator Company, 2807 Fourth Avenue South, Minneapolis, Minn.

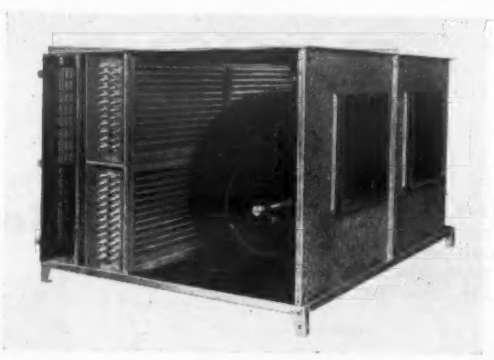
Quality Controls Cost Less Than Service

MINNEAPOLIS-HONEYWELL
Control Systems

Comfort Conditioning is EASY with these compact, complete Units

If you know where a "Comfort Conditioning" job might be sold—here's a unit you can sell! Designed exclusively for the job, built in capacities of from 3 to 24 tons—Buffalo "PC" Cabinets are available in combinations suitable for simple cooling only up to a construction giving complete air conditioning, including summer cooling and dehumidifying, winter heating and humidifying and year 'round air cleaning. They are designed for location outside the rooms to be conditioned, probably near the compressor, with ducts to and from the rooms.

The design is right, construction is sturdy and practical, operation is fool-proof. Engineers, contractors and users are enthusiastic about the results obtained with "PC" Cabinets.



"PC" Cabinet with side removed showing fans, cooling coils and filters.

WRITE for 24-PAGE BOOKLET 2968 on our Complete line of AIR CONDITIONING ACCESSORIES and Unit Coolers. Gives full specifications.

Contractors will find this book very valuable in figuring air conditioning installations.

BUFFALO FORGE COMPANY
487 BROADWAY BUFFALO, NEW YORK

Fedders

Fedders Mfg. Co.
Buffalo, N. Y.

Cabinet—Fedders all-copper and brass finish.

Blower—4-blade fan, direct driven.

Air Circulation—Air intake in rear, discharge in front. Inclined cooling element eliminates louvres.

Cooling System—Direct expansion. Fedders continuous tube, directed-flow coils, with provision for condensate to drain from rear of fins.

Controls—Thermostatic expansion valve. Intermittent switch may be used if desired.

For Duct-Type Units—Fedders also offers a complete line of cooling and dehumidifying coils for duct-type air-conditioning units. These units can be supplied in any size desired.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Suspended Type																			
208	$.....	21	...	.....	.....	1,230*	28	.....	....	...	Optional	1/250	1,650	8	360	....	.....	...	11½ x 13¼ x 11½
210	.....	30	...	.....	.....	2,100*	30	.....	....	...	Optional	1/125	1,500	10	388	....	.....	...	11½ x 13¼ x 12½
212	.....	47	...	.....	.....	3,500*	44	.....	....	...	Optional	1/30	1,150	12	786	....	.....	...	14 x 15¾ x 15¾
214	.....	63	...	.....	.....	4,550*	49	.....	....	...	Optional	1/30	1,150	14	1,146	....	.....	...	16⅝ x 17½ x 16
216	.....	83	...	.....	.....	5,600*	77	.....	....	...	Optional	1/20	850	16	1,228	....	.....	...	19¼ x 19⅜ x 18⅞
316	.....	125	...	.....	.....	7,000*	86	.....	....	...	Optional	1/20	850	16	1,190	....	.....	...	19¼ x 19⅜ x 20⅜
318	.....	215	...	.....	.....	12,310*	162	.....	....	...	Optional	1/15	860	18	1,852	....	.....	...	24⅜ x 23⅝ x 26¼
518	.....	359	...	.....	.....	18,220*	209	.....	....	...	Optional	⅛	1,150	18	2,500	....	.....	...	24⅜ x 23⅝ x 30½

*Refrigerant temperature 24° F.

Peerless

Peerless Ice Machine Co., Chicago, Ill.

Functions—Cooling & dehumidifying.

Blower—Wagner blower, driven by Wagner motor.

Air Circulation—Air intake, four sides. Air discharge, front.

Cooling System—Peerless copper cooling coils.

Control—Peerless thermostatic expansion valve.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Suspended Type																			
CC100	$170.00	70	...	4,000	8,000	12,000	75	.....	....	...	Any	1/40	950	16	12,000	850	.....	...	22 x 22 x 10

King

King Ventilating Co.
Owatonna, Minn.

Functions—Cooling and dehumidifying.

Cabinet—King cases of copper bearing galvanized iron, finished in green enamel.

Blower—King curvature-blade fans of aluminum construction.

Cooling System—Direct expansion or cold water. Copper coils with aluminum fins, assembled vertically to facilitate fast removal of the condensed moisture.

King Ventilating Co. also makes a complete line of air washers, which when used with mechanical refrigeration equipment, perform cooling functions.

Air Circulation—Air intake in rear, discharge in front. Louvred grille.

Controls—Furnished as desired.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Shipping Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Suspended Type																			
12	$.....	35	35	.....	.....	13,100*	85	.....	....	...	.....	1/20	1,140	12	525	....	60,762	...	18 x 20 x 19
14	.....	55	55	.....	.....	20,400*	110	.....	....	...	.....	1/15	1,140	14	800	....	87,637	...	21 x 23 x 20
17	.....	79	79	.....	.....	29,500*	160	.....	....	...	.....	1/10	840	17	1,200	....	116,850	...	24 x 26 x 21
19	.....	106	106	.....	.....	39,300*	185	.....	....	...	.....	⅛	840	19	1,600	....	38,950	...	15 x 17 x 19

*Rated at 80° F. dry bulb air temperature, with 60 per cent relative humidity and refrigerant temperature at 40° F.

Cochran

Cochran Metal Products
Trenton, N. J.

Functions—Cooling, dehumidifying, heating, humidifying, and cleaning.

Cabinet—Own make, finished in grained-baked enamel.

Air Circulation—Air intake in top, air discharge in bottom.

Compressor—Cochran rotary compressor, driven by shaded pole motor.

High side safety cut-out standard equipment.

Cooling System—Direct expansion, own make copper coils.

Blower—Cochran, direct driven.

Heating System—Copper heating coils. Can be used with hot water.

Air Cleaning Medium—Filter.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained																			
A	$57.50	5	5	.....	.....	2,000	40	.....	....	1/100	CH_3Cl	1/100	1,750	8	500	350	.....	...	30 x 15 x 15
B	77.50	7½	7½	.....	.....	3,000	50	.....	....	1/100	CH_3Cl	1/100	1,750	10	750	500	.....	...	30 x 15 x 15
C	97.50	10	10	.....	.....	4,000	60	.....	....	1/100	CH_3Cl	1/100	1,750	12	1,000	750	.....	...	30 x 15 x 15

Standard

Standard Air Conditioning, Inc.
New York, N. Y.

Functions—Models 350C, 355D, and L: cooling, dehumidifying, heating, humidifying, cleaning; all others—cooling and dehumidifying.

Cabinet—Standard Air Conditioning cabinet, finished in ivory Duco.

Compressor—Two-cylinder compressor, driven by G-E motor. G-E motor starter, Detroit Lubricator high side safety cut-out and compressor control. Refrigerant charge: model 350C, 5½ lbs.; model 550J, 3½ lbs.; other models, 5 lbs.

Cooling System—Direct expansion.
Type of Humidifier—Evaporative.

Blower—American Blower, direct-driven by a Holtzer-Cabot capacitor motor.

Air Circulation—Air intake in base, air discharge in top. Fresh air intake provided on models 350C and 355D. Own make of discharge grille.

Air Cleaning Medium—Filtro-Bac filter.

Controls—Thermostatic expansion valve, Automatic Products liquid line solenoid valve, Penn water regulating valve.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained Floor Type																			
350C	$.....	...	...	.....	.....	7,000	....	2 x 2½	400	½	Freon	1/20	...	...	300	....	13,200	1.3	29½ x 59 x 15
550J	.....	...	...	.....	.....	4,000	....	2 x 1½	400	½	Freon	1/20	...	...	400	....	.....	...	28 x 46 x 17½
Remote Floor Type																			
350C	$.....	...	...	.....	.....	7,000	....	2 x 2½	400	1	Freon	1/20	...	...	300	....	13,200	1.3	29½ x 59 x 15
355D	.....	...	...	.....	.....	12,000	....	2⅛ x 2⅝	420	1	Freon	1/20	...	...	400	....	16,800	1.3	29½ x 59 x 15
550J	.....	...	...	.....	.....	4,000	....	2 x 1½	400	½	Freon	1/20	...	...	300	....	.....	....	28 x 46 x 17½
1050K	.....	...	...	.....	.....	12,000	....	2⅛ x 2⅝	420	1	Freon	1/20	...	...	400	....	.....	....	31 x 43½ x 15½
L	.....	...	...	.....	.....	12,000	....	2⅛ x 2⅝	420	1	Freon	1/20	...	...	400	....	16,800	1.3	31 x 43½ x 15½

U. S. Airco

U. S. Air Conditioning Corp.
Minneapolis, Minn.

Functions — Self-contained type: cooling and dehumidifying. Remote floor type: cooling, dehumidifying, and humidifying. Suspended type: cooling and dehumidifying. Duct type: cooling, dehumidifying, humidifying, heating, and cleaning.

Cabinet—Sheet steel cabinet with grained mahogany finish for all except duct type, which is given a shop coat.

Cooling System—All but duct type have direct expansion systems, duct type using cold water. U. S. Airco copper cooling coils.

Blower—U. S. "Airco" blower, driven by Louis Allis or Century motor.

Air Circulation—Air intake at bottom, discharge at top. Fresh air intake provided on duct-type conditioner. Uniflo grilles used on self-contained and remote floor type, U. S. Airco grilles on suspended type and duct type.

Air Cleaning Medium—Spray type.

Heating System—U. S. Airco copper heating coils. Can be used with hot water.

Controls — Thermostatic expansion valve, thermostat, humidistat, liquid line solenoid valve, water regulating valve, air by-pass dampers.

Model No.	Price	Surfaces Sq. Ft. Cool	Heat	Refrigeration Capacity: Dehumidification	Sensible Heat	Total	Net Weight	Compressor: Bore & Stroke	Speed (R.p.m.)	Motor Hp.	Refrigerant	Blower: Motor Hp.	Speed R.p.m.	Diameter In.	Total C.f.m.	Velocity F.p.m.	Heating Capacity B.t.u.	Humidification Lbs./hr.	Overall Dimensions
Self-Contained Floor Type																			
Dri-Cool	$.....	...	...	.....	.....	12,000 to 1,200,000	....	.....	....	...	Freon	....	...	...	...	....	.....	...	52 x 30 x 28
Floor Type																			
Dri-Cool	$.....	...	...	.....	.....	12,000 to 1,200,000	....	.....	....	...	Freon	....	...	...	...	....	.....	...	30 x 40 x 13
Suspended Type																			
Refrigerated Kooler-Aire	$.....	...	...	.....	.....	12,000 to 1,200,000	....	.....	....	...	Freon	....	...	...	...	....	.....	...	16 x 14 x 10
Duct Type																			
Refrigerated Kooler-Aire	$.....	...	...	.....	.....	12,000 to 1,200,000	....	.....	....	...	Freon	....	...	...	...	....	.....	...	.....

Carraway

Carraway Engineering Co., Inc.
Dallas, Tex.

Carraway builds a complete, year-'round central air-conditioning system adaptable to the application. It has a positive type blower, driven by A and V-type belts. On vertical models the air intake is in the base of the conditioner, in horizontal models, it is in one end. The vertical models discharge the conditioned air from the top, the horizontal models from the other end. Uniflo grilles are used. Provision is made for fresh air intake.

Cooling is by direct expansion. Copper tubing is used for standard coil assemblies, steel and aluminum coils are used for special applications.

Copper tubing is also used for the heating coils with cast-iron headers.

Three different cooling coil assemblies are provided, with a range of from 36,000 to 180,000 B.t.u.'s per hour.

Heating is by forced hot water circulating system in six different capacity ranges from 70,000 to 350,000 B.t.u.'s. Steam is used on special application only.

An atomizer-type humidifier, actuated by a thermostat and solenoid valve, is employed. Water used for humidifying is at 70° F. Dry filters are used for cleaning.

Control devices are specially designed by the Carraway Engineering Co.

McQuay

McQuay, Inc.
Minneapolis, Minn.

Suspended-type units for cooling and dehumidifying functions, made in five different sizes. Complete coil assemblies for duct-type air-conditioning systems.

Mellish & Murray

Mellish & Murray
Chicago, Ill.

Special duct-type conditioners performing all functions. Trane heating and cooling coils used. Cooling coils suitable for Freon, carbon dioxide, or ammonia as refrigerant. Cold water can also be used.

Young Radiator

Young Radiator Co.
Racine, Wis.

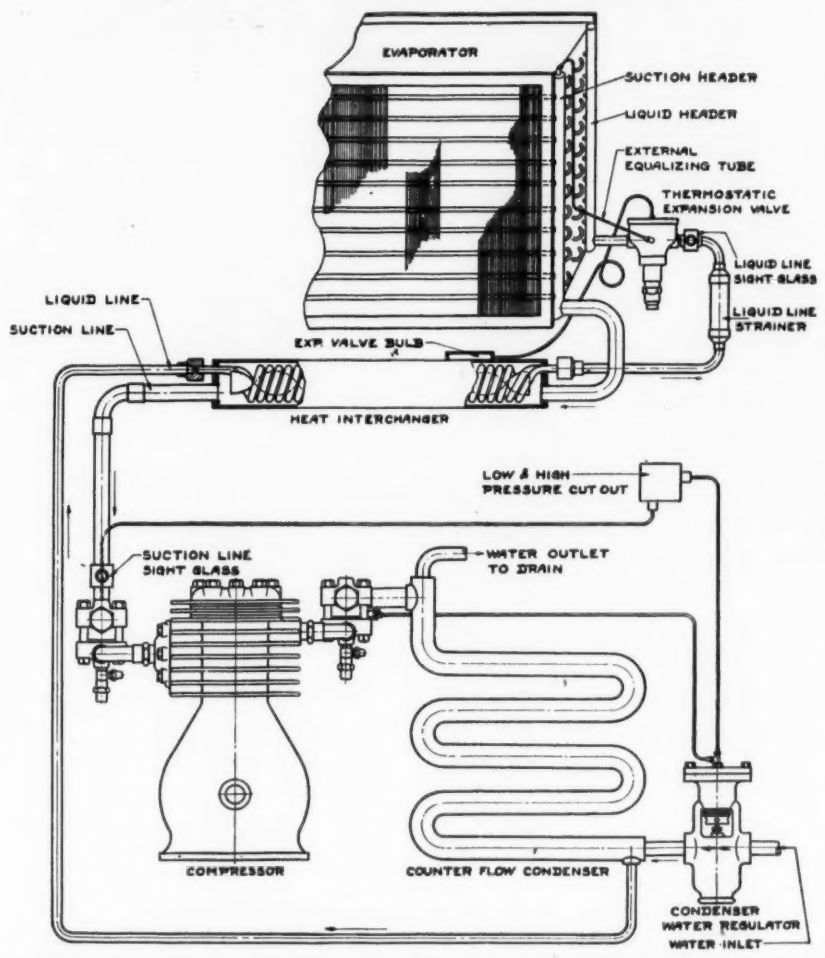
Young Radiator Co. manufactures air-conditioning equipment for particular applications, but does not carry stock units. The Young units can be built to accomplish all five functions of cooling, dehumidifying, heating, humidifying, and cleaning.

Scott-Newcomb

Scott-Newcomb, Inc.
St. Louis, Mo.

Scott-Newcomb builds a duct-type conditioner which performs all the functions of a year-'round conditioner when it is connected with a refrigeration system. It comes in two models, one oil fired and the other gas fired. A belt-driven blower, with a ¼ or ⅓-hp. motor, supplies from 1,500 to 2,000 c.f.m. Spray or pan type humidification is furnished. Cleaning is by American or Dustop filters. Controls include thermostat, humidistat and water regulating valve.

Lipman's 1935 Conditioner



Drawing showing arrangement and placement of various component parts in Lipman self-contained air conditioner for duct-type installations.

Examples of Evaporative Cooling Given In Air-Conditioning Lesson

(*Concluded from Page 17, Column 5*)

its dry bulb temperature will drop to the wet bulb temperature as it leaves the humidifier. Some of the water will be evaporated into the air and this part of the water supply must be replaced; the balance being used over and over again.

Now we may go back to the case we are working on in Dallas where we start off with a dry bulb temperature of 99°, a wet bulb temperature of 76°, a relative humidity of 35 per cent and a wet bulb depression of 23°. We shall use our spray water over and over without any special means for cooling it.

This means that the water supply will come up to the wet bulb temperature of 76° and stay there. Supposing we circulate the air through the sprays in such a manner as to reach a condition of 80° dry bulb and 84 per cent relative humidity. We would have a reduction in dry bulb temperature of 19° and an increase of relatime humidity from 35 per cent to 84 per cent—but the resulting conditioned air would be more comfortable than the outdoor air.

Were we to try evaporative cooling in Minneapolis where we have a wet bulb depression of only 12° the system would not work out so well, as you will see from the following figures. Our average summer condition in Minneapolis includes a dry bulb temperature of 84°, a wet bulb temperature of 72° and a relative humidity of 57 per cent. Maintaining the same wet bulb temperature of 72°, which means the same total heat, the psychrometric chart shows we may have the following combinations with lower dry bulb temperatures:

84° dry bulb— 57 % relative humidity
80° dry bulb— 69 % relative humidity
75° dry bulb— 88 % relative humidity
72° dry bulb—100 % relative humidity

Thus, even were we to allow the air to be completely saturated, or to reach a condition of 100 per cent relative humidity, we would have dropped the dry bulb temperature only from 84° to 72°, a drop of 12°. We could not use this entire temperature drop because we would be worse off with 100 per cent relative humidity no matter what the temperature might be with any reasonable limits.

The dry bulb temperature drop we could obtain without going above the comfort limits in relative humidity would hardly be worth while in changing our position with reference to the comfort zone.

The purpose for which the conditioned space is used has an important bearing on whether evaporative cooling, or atmospheric cooling as it is sometimes called, may be successful. As you have seen, we must increase the relative humidity with this method and our chief limitation is in having an excessive increase of humidity.

If the place being treated has a heat load including much latent heat or has a heat load made up in considerable part of moisture, then we are quite likely to run into trouble with evaporative cooling. For example, in a restaurant or in a theater, where there are a great many people giving off moisture in addition to sensible heat, the added water vapor from this source along with the humidity increase due to the process of evaporative cooling would be very likely to raise the humidity well above the comfort limits even though we might have a reduction of dry bulb temperature.

On the other hand, in places such as small offices, residences, and in factories where much of the heat load is from light and power which adds no moisture, we might be very successful with evaporative cooling.

VIRGINIA SMELTING Company
WEST NORFOLK, VIRGINIA
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Extra Dry
ESOTOO
LIQUID SULPHUR DIOXIDE
V-METH-L
METHYL CHLORIDE

BRUNNER
Send for the New
REFRIGERATION CATALOG
Eight Models of Compressors
Forty-one Models of Highsides
from 1/6 H. P. to 15 H. P.
BRUNNER MANUFACTURING CO.
UTICA, N. Y.

Ohio Edison Salesmen Visit Frigidaire

DAYTON—As a reward for leading all divisions of the Ohio Edison Co. in Frigidaire sales during 1934, 25 salesmen of the company's Akron division arrived here last week for a trip through the Frigidaire factory.

Headed by Ohio Edison Co. officials G. W. Longwell, G. P. Tschumi, and P. F. Mannweiler, the salesmen saw production of Frigidaire's 1935 models moving along at top speed and displayed keen interest in the production methods.

Following the factory trip, the group attended a banquet held in their honor at the Hotel Van Cleve.

Wehle Will Distribute Stewart-Warners

ROCHESTER, N. Y.—Appointment of the Wehle Electric Co., 292 Andrews St. here, as distributor for Stewart-Warner refrigerators and radios has been announced by officials of the Stewart-Warner Corp., Edwin C. Wehle heads the concern.

Self-Contained Duct Unit in Lipman Line

(*Concluded from Page 1, Column 3*)

is especially designed for air conditioning operations.

This conditioner is designed for cooling, dehumidification, and circulation, with provision for ventilation (introduction of fresh air) where desired. By adding heating coils, humidifying apparatus and filters it becomes a year-'round unit.

Air ducts and grilles are not included with the units, Lipman engineers pointing out that this allows flexibility in field installations. Flanges are provided on the top, however, for connection to the discharge air ducts. The evaporator housing is tapped to provide connection of the intake air duct.

Twin blower fans are attached to the double shaft extensions of the ½-hp. fan motor. Entire assembly of fan housing and motor is mounted on rubber for quiet operation.

The evaporator is of the header type construction. Tubes and fins are copper, bonded together by sweating. Uniform distribution of the refrigerant is accomplished by means of a liquid header, and only one thermostatic expansion valve is used to feed the evaporator. Refrigerant flow through the tubes progresses toward the air inlet side of the evaporator, thus embodying a counterflow principle. A large-capacity heat interchanger is a feature of the system.

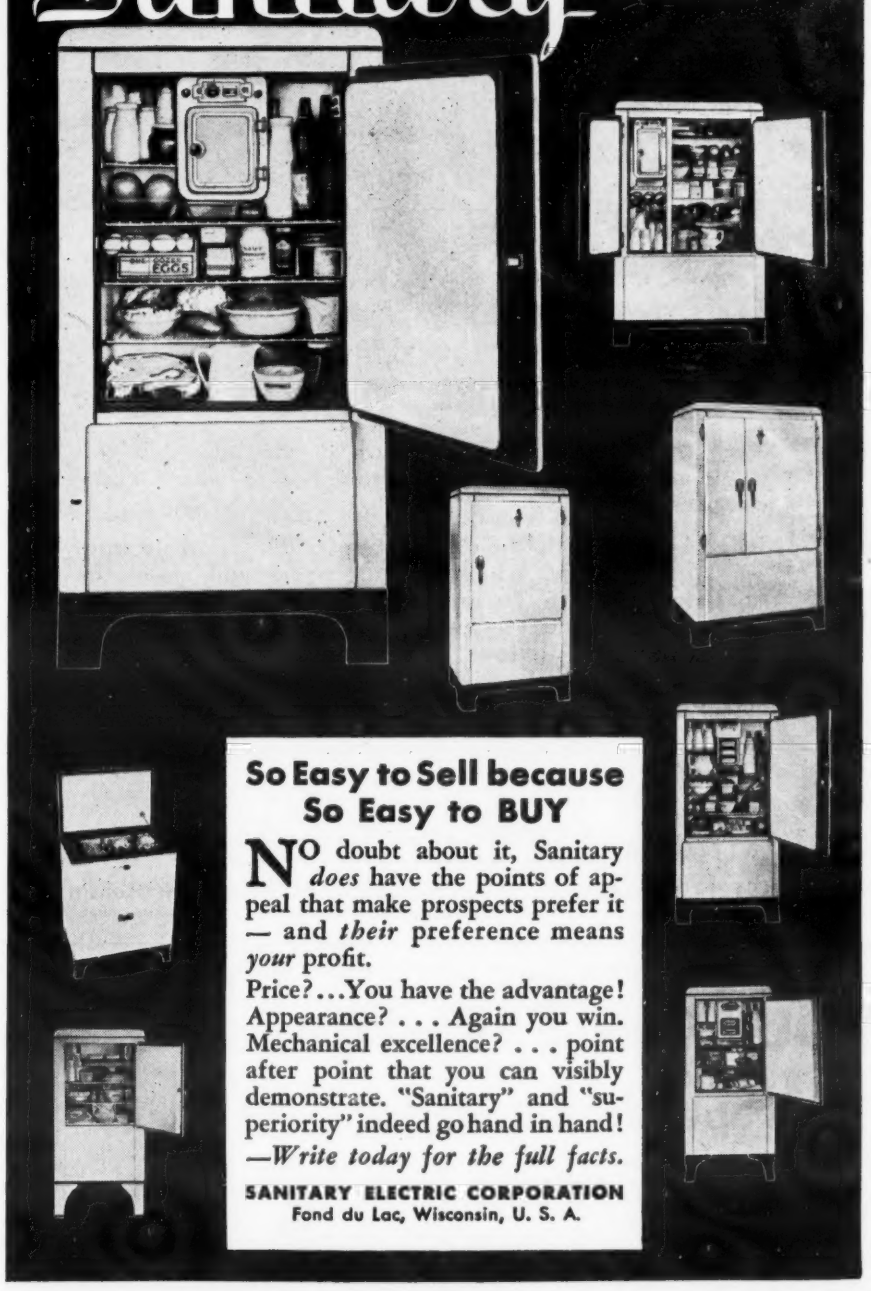
The motor control is completely wired and all electrical connections to the motors and the high and low pressure cutouts are made at the factory. The control box encloses two automatic starters, one for the compressor motor and one for the fan motor. Both starters have thermal overload protection for the motors.

Control wiring is so arranged that the compressor and fan both run when cooling is required; also, the fan alone may run for ventilation without cooling, or for circulating the air when the unit is used in connection with a heating system.

The automatic motor starters are electrically interlocked so that the compressor cannot be run unless the fan also runs.

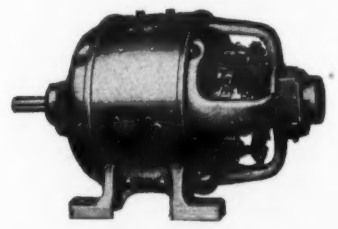
The welded steel frame of the Lipman self-contained conditioner is made in two sections. The upper section containing the evaporator and blower fan is bolted to the lower section, which contains the condensing unit, thus making it easy to take it apart.

Improved still more for 1935
Sanitary ELECTRIC REFRIGERATORS



So Easy to Sell because So Easy to BUY

NO doubt about it, Sanitary *does* have the points of appeal that make prospects prefer it — and *their* preference means *your* profit.
Price?...You have the advantage!
Appearance? . . . Again you win.
Mechanical excellence? . . . point after point that you can visibly demonstrate. "Sanitary" and "superiority" indeed go hand in hand!
—Write today for the full facts.
SANITARY ELECTRIC CORPORATION
Fond du Lac, Wisconsin, U. S. A.



DIRECT CURRENT?

Wherever direct current is the power source for driving any type of Electrical Refrigerating Equipment, Century Direct Current Motors will meet every exacting requirement . . . Long life and satisfactory operating are assured by: Rolled Steel Frames—Refined Grey Cast Iron End Brackets—Phosphor Bronze Bearings, Ring-Oil or Wool Yarn Lubrication and Ball Bearings Grease Lubricated—Liberally Proportioned Armature and Commutator. Sizes up to 150 H. P.

CENTURY ELECTRIC COMPANY
1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities

Century MOTORS

HEAD PRESSURE WATER VALVE

Model 67 valve regulates the flow of the condenser coil water and is operated by the actual head pressure of the compressor.

It is based upon the by-pass principle. The head pressure operates a bellows which in turn opens and closes the small by-pass. This in turn operates a diaphragm which opens the main valve. Operation is of a throttling nature. Very accessible. Bellows and charge held in leak proof drop forged brass housing. Entire construction of brass and non-ferrous parts.

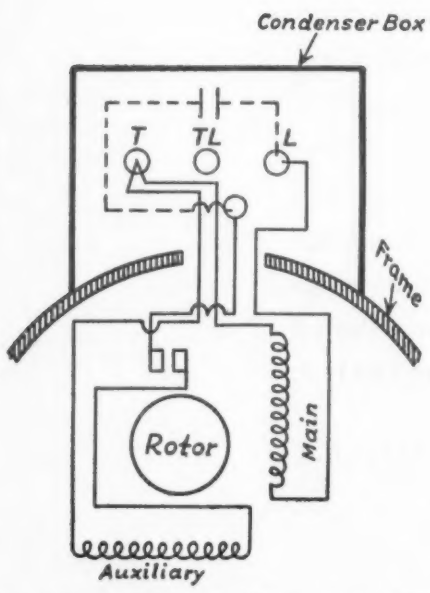
This is an outstanding development in water valves. Write for Bulletin 407 for complete details.

AUTOMATIC PRODUCTS COMPANY
121 N. Broadway Milwaukee, Wisconsin

BUILT-IN TERMINAL BOARD

Speeds Refrigerator Assembly ....Reduces Installation Costs

Another feature of Wagner Type RBZR Capacitor-Start Induction-Run Capacitor Motors



Connection diagram of the Wagner types RBZ and RBZR capacitor motors. If no thermostat is used, line is connected to terminals T and L. If thermostat is used, line is connected to terminals TL and L, and the thermostat to terminals T and TL.

In the Wagner type RBZR capacitor motor, a built-in terminal board provided with studs simplifies connections . . . . . speeds assembly . . . reduces installation costs.

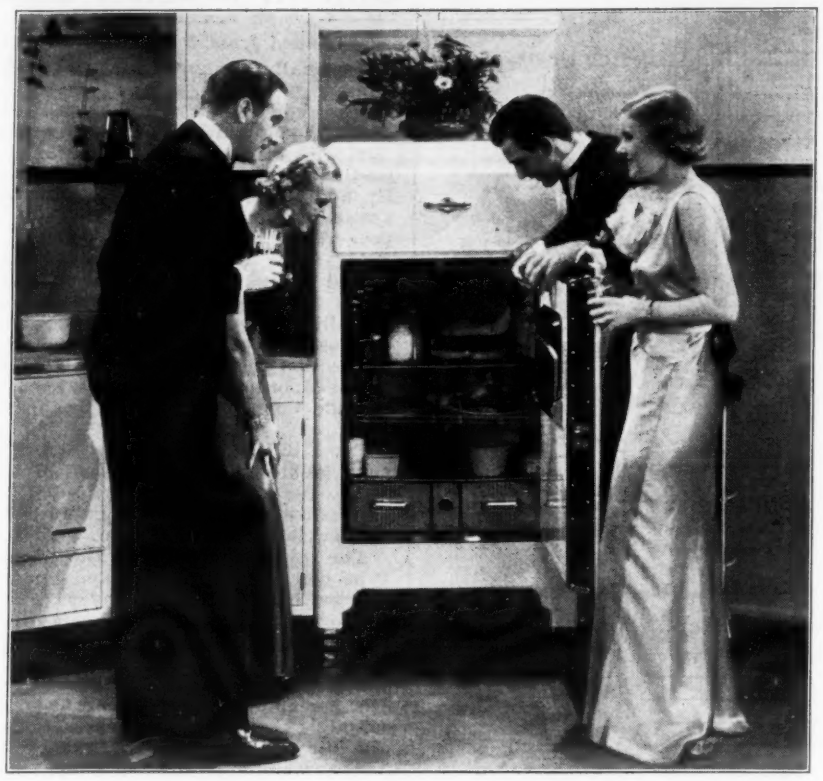
The terminals are readily accessible for making line, thermostat, light-switch, and other connections. Leads can be quickly connected to the terminal posts since no soldering or splicing of leads is necessary. The terminal box has outlets for rubber-covered cables and is also provided with knockouts for standard BX connectors.

Wagner capacitor motors have many other features that will reduce your costs and thereby assure you larger profits. Investigate the advantages of Wagner capacitor motors. Ask for our Bulletin 167, Part 6.

S435-2

Wagner Electric Corporation
6400 Plymouth Avenue, Saint Louis, U.S.A.
MOTORS TRANSFORMERS FANS BRAKES

Westinghouse in Technicolor



Scene from one of the Technicolor talking motion picture "shorts" which were made at a West Coast studio for use as a sales promotion feature by Westinghouse refrigeration retailers.

Refrigeration Industry's 1934 Magazine Advertising Cost $1,813,553

By A. J. Cutting

DETROIT—Refrigeration advertising in national magazines during 1934 showed an increase of better than 100 per cent over 1933 with 10 manufacturers spending $1,813,553 as compared with $853,156 spent by six companies in 1933, according to figures compiled by Curtis Publishing Co.

Of the total amount, $1,611,175 was spent for advertising electric refrigeration products and $202,378 for non-electric refrigeration advertising.

In spite of the increase registered over the 1933 figure, the 1934 total is the second lowest amount reported for industry manufacturers in the period 1928 through 1934.

Companies Reporting

The 1934 report includes advertising expenditures by Crosley Radio Corp., Frigidaire Corp., General Electric Co., General Household Utilities Co., Kelvinator Corp., Leonard Refrigerator Co., Norge Corp., Servel, Inc., Electrolux Refrigerator Sales Div., Stewart-Warner Corp., and Westinghouse Electric & Mfg. Co.

Frigidaire Corp. was the leading advertiser during 1934 spending $384,871 for advertising space in nine national publications. Of the total amount, $365,171 was appropriated for advertising the Frigidaire household refrigerator, $18,000 for commercial refrigeration advertising, and $1,700 for advertising Frigidaire water coolers.

General Electric Co. ranked second expending $366,505 in 11 national magazines for advertising the General Electric refrigerator. Kelvinator Corp. ranked third spending $286,460 for space in six magazines, $282,860 for advertising the Kelvinator household refrigerator and $3,600 for commercial refrigeration advertising.

Among the publications, *Saturday Evening Post* ranked first carrying refrigeration advertising valued at $732,670, or 40.4 per cent of the total amount. Expenditures amounting to $338,788, or 18.7 per cent, were made for space in *Good Housekeeping*, and $195,020, or 10.8 per cent, was spent for advertising in Collier's.

A record of the amounts spent by each of the 10 manufacturers and the publications used by each company follows. The expenditures are for household refrigeration except when otherwise indicated.

Crosley

Crosley Radio Corp.

Saturday Evening Post	$19,105
McCall's	11,209
Good Housekeeping	10,308
Time	6,910
Ladies' Home Journal	2,916
Woman's Home Compaion	2,616
Hearst's-Cosmopolitan	2,322
American Magazine	2,170
The New Yorker	900
Popular Mechanics	868
Total	**$59,324**

Frigidaire

Frigidaire Corp.

Saturday Evening Post (Household)	$ 88,785
Commercial)	18,000
Ladies' Home Journal	57,825
Good Housekeeping	48,600
Woman's Home Companion	46,206
Collier's	44,770
American Magazine	33,160
Liberty	24,325
Hearst's-Cosmopolitan	21,500
Nation's Business (Water Coolers)	1,700
Total	**$384,871**

General Electric

General Electric Co.

Saturday Evening Post	$157,860
Collier's	61,250
Good Housekeeping	33,600
Ladies' Home Journal	29,925
Woman's Home Companion	27,170
Better Homes & Gardens	22,950
National Geographic	14,600
American Magazine	13,600
Fortune	2,900
Time	2,050
The New Yorker	600
Total	**$366,505**

Grunow

General Household Utilities Co.

Saturday Evening Post	$23,760
Total	**$23,760**

Kelvinator

Kelvinator Corp.

Saturday Evening Post	$100,440
Good Housekeeping	50,400
McCall's	48,000
Ladies' Home Journal	45,000
Collier's	36,500
Fortune (Household)	2,520
Fortune (Commercial)	3,600
Total	**$286,460**

Leonard

Leonard Refrigerator Co.

Saturday Evening Post	$ 43,200
Woman's Home Compaion	34,650
Good Housekeeping	28,000
Collier's	17,500
Total	**$123,350**

Norge

Norge Corp.

Saturday Evening Post	$ 73,350
Good Housekeeping	54,200
Total	**$127,550**

Stewart-Warner

Stewart-Warner Corp.

Saturday Evening Post	$37,170
Good Housekeeping	18,480
Total	**$55,650**

Westinghouse

Westinghouse Electric & Mfg. Co.

Saturday Evening Post	$102,600
Good Housekeeping	67,200
Fortune (Water Coolers)	1,600
Total	**$171,400**

Electrolux

Servel, Inc.
(Electrolux Refrigerator Sales, Inc.)

Saturday Evening Post	$ 50,400
Collier's	35,000
Good Housekeeping	28,000
Better Homes & Gardens	20,250
Hearst's-Cosmopolitan	12,600
American Magazine	12,090
Time	10,220
Country Gentleman	5,625
Farmer's Wife	3,100
Capper's Farmer	2,800
The New Yorker	850
Total	**$183,845**

TOTALS Electric Refrigeration

Publications

Saturday Evening Post	$ 671,470
Good Housekeeping	310,788
Collier's	160,020
Ladies' Home Journal	135,666
Woman's Home Companion	110,642
McCall's	62,909
American Magazine	48,930
Liberty	24,325
Hearst's-Cosmopolitan	23,822
Better Homes & Gardens	22,950
National Geographic	14,600
Fortune	11,500
Time	9,485
Nation's Business	1,700
The New Yorker	1,500
Popular Mechanics	868
Total	**$1,611,175**

TOTALS Non-Electric Refrigeration

Publications

Saturday Evening Post	$ 61,200
Collier's	35,000
Good Housekeeping	28,000
Better Homes & Gardens	20,250
Hearst's-Cosmopolitan	12,600
Country Gentleman	12,375
American Magazine	12,000
Time	10,220
Successful Farming	3,830
Farmer's Wife	3,100
Capper's Farmer	2,800
The New Yorker	1,003
Total	**$202,378**

Refrigeration Is 8th Largest Industry In Michigan

DETROIT—The refrigeration industry has registered the greatest change among Michigan's manufacturing industries since 1929, moving up in importance from twentieth place in 1929 to ninth in 1931 and to eighth in 1933, according to a summary released by the United States Bureau of the Census.

Refrigeration products manufactured in Michigan during 1933 were valued at $31,883,729. The total value of manufactured products for the state in 1933 was reported at $2,104,104,000 as compared with $2,551,258,000 in 1931.

The first three ranking industries in value of products were motor vehicles, reported at $588,301,753; motor vehicle bodies and parts, $496,555,495; and foundry and machine shop products, $90,189,267. These industries also led in this same order in 1929 and 1931.

Michigan's chemical industry advanced from thirteenth place in 1929 to tenth in 1931 and fifth in 1933, while the steel industry ranked twelfth in 1929, fourteenth in 1931, and ninth in 1933. The state's paper industry ranked fifth in 1929 and fourth in 1931 and 1933. Little change is noticeable in the bread and baking industry or in the cereal industry. Printing and publishing of newspapers and periodicals held tenth place in 1933 and in 1929, and was in sixth place in 1931.

There can be no substitute for Quality

ANSUL REFRIGERANTS ARE ANALYZED

When you buy refrigerants you want to be certain that they will give perfect performance. That is why you should standardize on Ansul Sulphur Dioxide and Ansul Methyl Chloride. Every cylinder, large and small, is individually analyzed before it leaves our plant. You can be certain that the contents are perfect for refrigeration purposes.

Ansul's 20th Anniversary in the Production of Sulphur Dioxide

ANSUL CHEMICAL CO.
MARINETTE - - WISCONSIN

Polk Reports Survey Results in 4 Cities

DETROIT—Further returns from the Consumer Census, nation-wide home survey being conducted by R. L. Polk & Co. of Detroit, have recently been made available to ELECTRIC REFRIGERATION NEWS. Latest returns cover markets and refrigerator ownership in Greenfield, Mass., Miami, Fla., Troy, N. Y., and Worcester, Mass., supplementing the data for 18 other American cities published in the Sept. 19, 1934, issue of ELECTRIC REFRIGERATION NEWS.

According to the Polk system of rating, families are divided into Classes A, B, or C according to buying power. In determining the buying power status of a family, factors considered include average rent paid, whether or not the home is owned, whether the family has a telephone, the index and evaluation ratings of the district and ownership of various home appliances. Other items given consideration are whether checking and saving accounts are maintained, the average insurance carried and whether an automobile is owned. The method of classification into these groups thus rates families according to "average" spending ability.

Of 6,680 families in Greenfield, Mass., 24.3 per cent owned mechanical refrigerators with ownership by income groups divided as follows: 93.3 per cent of 300 Class A families, 43.2 per cent of 1,760 Class B families, and 12.6 per cent of 4,620 Class C families.

Saturation among 40,720 families in Miami, Fla., was found to be 22.4 per cent. Refrigerators were owned by 89.1 per cent of 2,200 Class A families, 52.3 per cent of 9,760 Class B families, and 7.2 per cent of 28,760 Class C families.

In Troy, N. Y., refrigerators were owned by 22.0 per cent of 29,060 families with ownership attributed to 86.4 per cent of 880 Class A families, 39.7 per cent of 11,080 Class B families, and 7.3 per cent of 17,100 Class C families.

The lowest percentage of saturation was found in Worcester, Mass., where only 13.8 per cent of 52,300 families owned mechanical refrigerators. Class A families numbered 2,520 of which 64.3 per cent owned refrigerators, while ownership was recorded for 20.2 per cent of 25,580 Class B families, and only 1.7 per cent of 24,200 Class C families.

Considering age in years, it was found that 7.2 per cent of the refrigerators in Greenfield were over four years old as compared with 4.8 per cent less than one year old. In Miami, 5.8 per cent of the refrigerators had been in use for over four years while 7.3 per cent had been in operation for less than one year.

Investigators in Troy found that 4.9 per cent of refrigerators had been in use for over four years, while 6.0 per cent had been owned for under one year. In Worcester, 4.6 per cent of refrigerators were over four years old and 3.1 per cent were less than a year old.

Information for the Consumer Census is collected by Polk investigators by means of house-to-house interviews with women heads of families. In each case, it is understood that a sufficiently large sample is taken to give a representative cross-section for use as a basis in making calculations for the city as a whole.

Results of Polk Survey

Miami, Fla.

	No.	Per Cent
No. of families	40,720	
Do not own mechanical refrigerator	31,600	77.603
Own mechanical refrigerator	9,120	22.397
Makes owned:		
Apex	.....	.933
Coldspot	.....	1.375
Copeland	.....	.442
Electrolux	.....	.589
Frigidaire	.....	9.381
General Electric	.....	4.077
Kelvinator	.....	1.670
Norge	.....	1.032
Westinghouse	.....	.835
Miscellaneous	.....	2.063
Age in years:		
Under 1 year	2,980	7.318
1-2 years	1,460	3.586
2-3 years	1,280	3.143
3-4 years	1,020	2.505
Over 4 years	2,380	5.845
Class "A" families	2,200	.....
No mechanical refrigerator	240	10.909
Own mechanical refrigerator	1,960	89.091
Class "B" families	9,760	.....
No mechanical refrigerator	4,660	47.746
Own mechanical refrigerator	5,100	52.254
Class "C" families	28,760	.....
No mechanical refrigerator	26,700	92.837
Own mechanical refrigerator	2,060	7.163

Troy, N.Y.

	No.	Per Cent
No. of families	29,060	.....
Do not own mechanical refrigerator	22,660	77.977
Own mechanical refrigerator	6,400	22.023
Makes owned:		
Coldspot	.....	.895
Crosley	.....	.413
Frigidaire	.....	4.130
General Electric	.....	8.053
Grunow	.....	.688
Kelvinator	.....	1.514
Leonard	.....	1.032
Mayflower	.....	.619
Majestic	.....	.688
Norge	.....	1.032
Servel	.....	.619
Westinghouse	.....	.688
Miscellaneous	.....	1.652
Age in years:		
Under 1 year	1,740	5.988
1-2 years	1,320	4.542
2-3 years	840	2.891
3-4 years	1,080	3.716
Over 4 years	1,420	4.886
Class "A" families	880	.....
No mechanical refrigerator	120	13.636
Own mechanical refrigerator	760	86.364
Class "B" families	11,080	.....
No mechanical refrigerator	6,680	60.289
Own mechanical refrigerator	4,400	39.711
Class "C" families	17,100	.....
No mechanical refrigerator	15,860	92.748
Own mechanical refrigerator	1,240	7.252

Greenfield, Mass.

	No.	Per Cent
No. of families	6,680	.....
Do not own mechanical refrigerator	5,060	75.749
Own mechanical refrigerator	1,620	24.251
Makes owned:		
Copeland	.....	1.198
Electrolux	.....	.898
Frigidaire	.....	4.790
General Electric	.....	8.084
Kelvinator	.....	2.096
Majestic	.....	.898
Norge	.....	1.497
Servel	.....	.898
Westinghouse	.....	2.994
Miscellaneous	.....	.898
Age in years:		
Under 1 year	320	4.790
1-2 years	220	3.293
2-3 years	260	3.892
3-4 years	340	5.090
Over 4 years	480	7.186
Class "A" families	300	.....
No mechanical refrigerator	20	6.667
Own mechanical refrigerator	280	93.333
Class "B" families	1,760	.....
No mechanical refrigerator	1,000	56.818
Own mechanical refrigerator	760	43.182
Class "C" families	4,620	.....
No mechanical refrigerator	4,040	87.446
Own mechanical refrigerator	580	12.554

Worcester, Mass.

	No.	Per Cent
No. of families	52,300	.....
Do not own mechanical refrigerators	45,100	86.233
Own mechanical refrigerator	7,200	13.767
Makes owned:		
Copeland	.....	.268
Coldspot	.....	.191
Crosley	.....	.076
Electrolux	.....	.459
Frigidaire	.....	2.830
General Electric	.....	3.403
Graybar	.....	.153
Grunow	.....	.535
Ice Berg	.....	.268
Kelvinator	.....	2.027
Leonard	.....	.115
Majestic	.....	.765
Mayflower	.....	.229
Norge	.....	.918
Servel	.....	.191
Welsbach	.....	.115
Westinghouse	.....	.956
Miscellaneous	.....	.268
Age in years:		
Under 1 year	1,640	3.136
1-2 years	1,020	1.950
2-3 years	1,140	2.180
3-4 years	1,020	1.950
Over 4 years	2,380	4.551
Class "A" families	2,520	.....
No mechanical refrigerator	900	35.714
Own mechanical refrigerator	1,620	64.286
Class "B" families	25,580	.....
No mechanical refrigerator	20,420	79.282
Own mechanical refrigerator	5,160	20.172
Class "C" families	24,200	.....
No mechanical refrigerator	23,780	98.265
Own mechanical refrigerator	420	1.735

EARNINGS

General Electric

The forty-third annual report of the General Electric Co., mailed to stockholders Monday, shows profits available for dividends of $19,726,044, equivalent, after $2,575,074 of regular 6 per cent cash dividends on the special stock, to 59 cents a share on 28,845,927 shares of no par value common stock, compared with $13,429,739, or 38 cents a share on the same number of shares in 1933.

Regular cash dividends of 60 cents a share on both the special and common stock amounted to $19,881,453, resulting in a deficit from operations of $155,410, which was taken from surplus.

Orders received amounted to $183,660,303 during 1934, compared with $142,770,791 during 1933, an increase of 29 per cent. Sales billed during 1934 were $164,797,317, compared with $136,637,268 during 1933, an increase of 21 per cent.

The dividend for the first quarter of 1935 of 15 cents per share was declared on the common stock, payable on April 25, 1935, to stockholders of record of March 15, 1935.

The annual report shows cash and marketable securities of approximately $108,000,000, compared with $112,000,000 last year. Current assets totaled $177,269,050 at the end of 1934, compared with $175,314,394 in 1933. Liabilities of $17,461,338 were reported for 1934 against $13,302,577 at the end of 1933.

Inventories, after deducting reserves, are carried at $51,313,973, compared with $45,467,409 for 1933. The increase of 13 per cent, the report says, resulted from a 29 per cent greater volume of orders received, and from a larger amount of unfilled orders at the end of the year.

Investments (including advances to affiliated companies) amounted at the end 1934 to $158,971,912 after revaluation in accordance with the usual practice of the company, compared with $154,682,341 at the close of 1933. Revaluation resulted in a charge to surplus of $1,195,793.

International General Electric Co., which conducts the export and foreign business of General Electric except in Canada, had a profit available for interest on capital advances and dividends of $2,263,549 for 1934, compared with $2,302,499 for 1933. Interest and dividends paid in 1934 amounted to $2,143,986, compared with $1,500,000 in 1933.

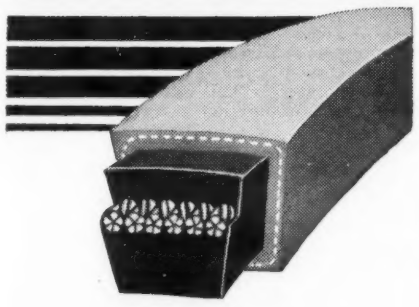
Canadian General Electric Co. reported net profit of $989,166 for 1934, compared with $635,176 for 1933. Dividends of 7 per cent were paid on preferred stock, and 6 per cent on common stock.

The company spent $5,263,322 on new plants in 1934, and wrote off depreciation amounting to $7,335,997, compared with $6,179,511 in 1933. The net book value at which plants were carried at the end of 1934 was $39,852,194, compared with $42,242,493 at the end of 1933.

The average number of employees during 1934 was 49,642, compared with 41,560 in 1933. Total earnings of these employees amounted to $75,227,000 for 1934 against $55,287,000 for 1933, an average annual earning of $1,515 and $1,330, respectively, or an increase of 14 per cent.

Between March 1, 1933 (the approximate low) and Dec. 1934 (the high), the number of employees on the payroll increased almost 37 per cent, and the total annual payroll rate increased from $47,604,000 to $81,300,000, or 70 per cent.

WIDE MARGIN OF STRENGTH



MANHATTAN V-BELTS

for Fractional Horsepower Service have a strong single layer endless whipcord section fully floated in rubber and placed on the neutral axis . . . Flexibility and maximum strength are scientifically incorporated in this exclusive construction. The whipcord is pretreated to remove as nearly as possible all inelastic stretch. Manhattan V-Belts have a minimum of stretch and operate smoothly during their entire life . . . Test Manhattan V-Belts for your drives. To eliminate noise—specify Manhattan.

For complete literature, write the factory or any of the following Sales Branches:

Birmingham Cleveland New Orleans
Boston Detroit New York
Chicago Minneapolis Philadelphia
Pittsburgh St. Louis

THE MANHATTAN RUBBER MFG. DIVISION of Raybestos-Manhattan, Inc.
Executive Offices and Factories
45 TOWNSEND ST., PASSAIC, N. J.

BUYER'S GUIDE

MANUFACTURERS SPECIALIZING IN SERVICE TO THE REFRIGERATION INDUSTRY

SPECIAL ADVERTISING RATE (this column only)—$12.00 per space.
Payment is required monthly in advance to obtain this special low rate.
Minimum Contract for this column—13 insertions in consecutive issues.

KRAMER
DOMESTIC EVAPORATORS
are made in stock sizes of 2 to 5 trays and to any specified size. Construction is all copper continuous tube design, processed below each tray sleeve.
Air and Water Cooled Conditioners
TRENTON AUTO RADIATOR WORKS
Main Offices and Factory, Trenton, N.J.
NEW YORK, 210-212 West 65th Street
PITTSBURGH, 5114 Liberty Avenue

See our advertisement on page 6

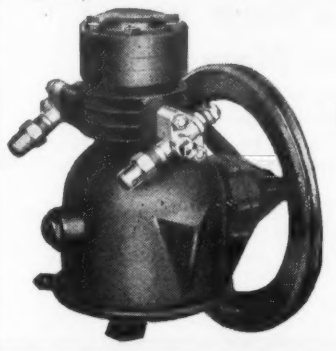
NO BROKEN BASES

There'll be no more broken bases and covers when you replace old thermostats with the new Ranco KRS

New Stainless Steel Models meet the service requirements of practically every household refrigerator, ice cream cabinet and water cooler. Simplified construction and plainly marked instructions assure speedy and accurate installation.

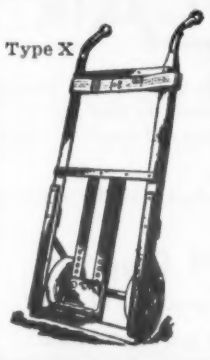
Complete descriptive information mailed free on request. Write today for Service Bulletin 628.

RANCO THERMOSTAT
THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO., Columbus, O.

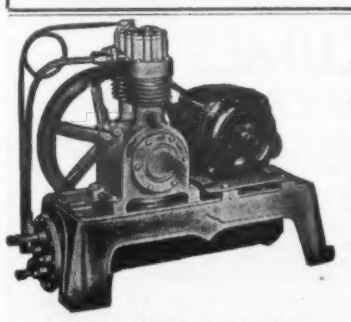


CONDENSING UNITS AND COMPRESSORS FOR HOUSEHOLD REFRIGERATION BY
JOMOCO, INC.
A SUBSIDIARY OF THE JOHNSON MOTOR CO.
Waukegan, Ill.
CABLE ADDRESS, JOMOCO-WAUKEGAN

Just Out New Catalog
Refrigeration PARTS and SUPPLIES
Send for New Catalog No. 109
The HARRY ALTER CO.
1728 S. MICHIGAN AVE. CHICAGO, ILL. U.S.A.
8,000 ITEMS FOR ALL MAKES
DOMESTIC COMMERCIAL AIR CONDITIONING

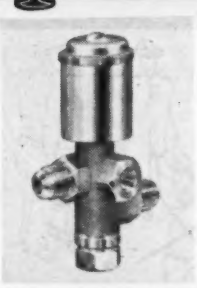


The DAYTON CARRIER TRUCK
Deliver your Refrigerators on Rubber
Will Not Mar—Speeds Delivery
Two sizes—Type X with 53 inch handles and 8 inch rubber wheels—Type Y with 70 inch handles, 8 inch rubber wheels and skids.
Type X with one strap $17.00
Type Y with one strap 18.50
f.o.b. Dayton
International Engineering Inc.
Dayton, Ohio 15 Park Row, N. Y.



STARR FREEZE
OUTSTANDING PERFORMANCE
attested by satisfied users — EVERYWHERE!
Sturdy Condensing Units from 80 to 2868 Lbs. I.M.E., and all other commercial refrigeration equipment—Wall type cases with machinery—A beautiful household line of modern, conservative styles—Write for full data.
THE STARR COMPANY
Cable "Starr" Richmond, Indiana (factory) U. S. A. Since 1927
1344 S. Flower St., Los Angeles, Calif.
Style EW—Water Cooled With Water Cooled Head

STANDARD REFRIGERATING APPLIANCES



TWO TEMPERATURE VALVES *with* BUILT-IN CHEEK
Write for bulletin on complete line covering refrigerating appliances, liquid line filters, dehydrators, acid neutralizers, standard parts and materials, service tools, shaft seals, bearing metals and parts. Descriptive literature will be gladly furnished on any or all of these lines on request.
AMERICAN INJECTOR COMPANY 1481-14th. Street, Detroit, Mich.

BUYER'S GUIDE

MANUFACTURERS SPECIALIZING IN SERVICE TO THE REFRIGERATION INDUSTRY

SPECIAL ADVERTISING RATE (this column only)—$12.00 per space.
Payment is required monthly in advance to obtain this special low rate.
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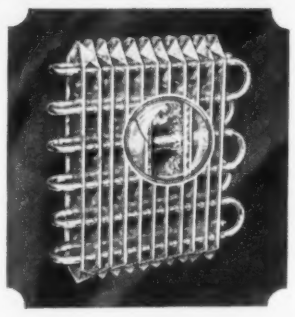
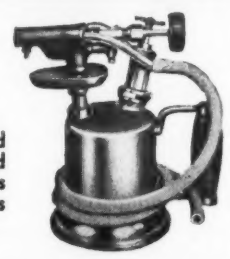


CONDITIONAIRE FIN COILS
The Coil with a Permanent Fin Contact
Standard size for every commercial application—
Suitable for all refrigerants—
Greater conductivity, greater efficiency—
Special sizes for air conditioning.
Write for Complete Data Book
CONDITIONAIRE UNIT COMPANY
2821 Montrose Ave. Chicago

HULL *Improved* Leak Detector

The most convenient, surest and quickest means of detecting and locating Halide Gas Leaks in refrigerating units.



Positive, Instantaneous
. . . most sensitive and accurate
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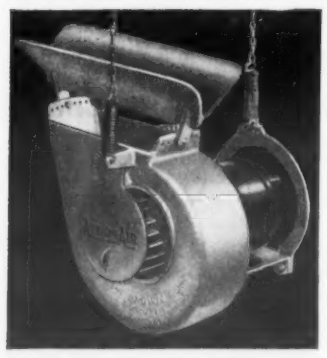

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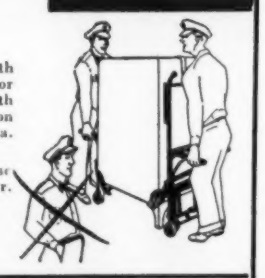

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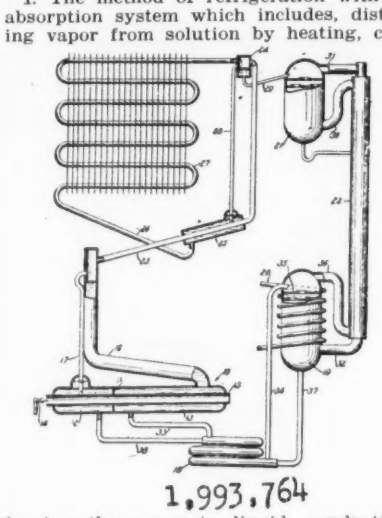
PATENTS

Issued March 12, 1935

1,993,764. REFRIGERATION. Hugo M. Ullstrand, Evansville, Ind., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application July 11, 1933. Serial No. 679,830. 14 Claims. (Cl. 62—119.5.)

1. The method of refrigeration with an absorption system which includes, distilling vapor from solution by heating, con-



1,993,764

densing the vapor to liquid, conducting the liquid at a first level in heat exchange relation with the distilled vapor to cool the latter by vaporization, utilizing the vapor thus produced to lift cooling liquid to a higher level, and evaporating the liquid at said higher level.

1,993,871. AIR CONDITIONER. Carl W. Burnap and John Weiss, Hibbing, Minn. Application Sept. 11, 1933. Serial No. 688,968. 4 Claims. (Cl. 237—78.)

1. A heating and humidifying unit for air conditioners comprising a heating radiator having an open chamber therein, granular material within said chamber, and means for the discharge of air conditioning material within and through said granular material.

1,993,998. REFRIGERATING RECEPTACLE. Carl Kuhnel, Berlin-Charlottenburg, and Eduard Rauscher, Berlin-Niederschonhausen, Germany, assignors to Siemens-Schuckertwerke Aktiengesellschaft, Berlin-Siemensstadt, Germany, a corporation of Germany. Application Feb. 9, 1933. Serial No. 655,874. In Germany Feb. 12, 1932. 8 Claims. (Cl. 62—99.)

1. In a refrigerating receptacle, in combination with a refrigerating apparatus, an annular evaporator, a vertical cooling chamber open at its upper end, said evaporator being disposed within the cooling chamber along the periphery of its entrance, and being exposed on all sides to the interior of said chamber, a removable cover for said receptacle, said cooling chamber being accessible through said cover, conduits for the supply and discharge of the refrigerant to and from said evaporator, said conduits being connected to said evaporator so as to cause a uniform evaporation of the refrigerant over the entire periphery of said evaporator.

1,994,006. AIR CLEANER AND SILENCER. George C. Rensick, Denver, Colo. Application Feb. 17, 1934. Serial No. 711,670. 12 Claims. (Cl. 183—44.)

1. In an air cleaner and silencer of the character described, a circular casing open at its bottom end, a circular air cleaner supported in said casing and spaced therefrom, a perforated cylinder within said air cleaner and spaced therefrom and closed at one end, a horizontal perforated diaphragm in said cylinder and pervious sound absorbing material filling the space between said diaphragm and said closed end, a second diaphragm spaced from the first diaphragm and having a central aperture, a member closing the other end of the cylinder and having a central aperture, an air outlet pipe extending through the aperture of the said closing member and into the aperture of the second diaphragm, and pervious sound absorbing material in the space between the second diaphragm and the closing member.

1,994,009. HEAT EXCHANGER. Heinrich Vorkauf, Berlin, Germany, assignor, by mesne assignments, to the firm Herpen & Vorkauf, Berlin, Germany. Application May 17, 1932. Serial No. 611,849. In Germany May 20, 1931. 24 Claims. (Cl. 122—11.)

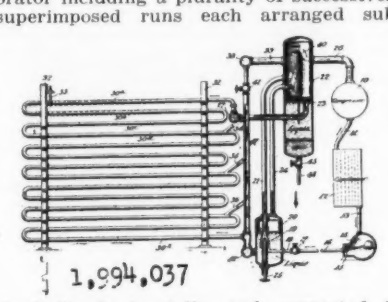
1. A heat exchanger comprising a heat exchange element of the type providing a defined path in which a fluid is heated while flowing threin, means for delivering the fluid to be heated to said element for flow therein, means for withdrawing the heated fluid from said element, means for revolving said element as a whole about an axis of revolution, said element being so arranged with respect to said axis of revolution that the fluid is delivered to said element adjacent said axis and so that the centrifugal force of said revolution acts upon said fluid in at least a part of said element so as to tend to produce flow of the fluid outwardly from said axis in said part, and means for so limiting the heating of said part of said element as to prevent the expansion of said fluid while in said part to a state so expanded as to interfere substantially with the flow producing action of the centrifugal force in said part whole heating a portion of said element succeeding said part in the direction of flow of the fluid to a state sufficiently expanded so that said centrifugal force acting upon said unexpanded fluid may cause said fluid to flow through said element and to discharge said expanded fluid therefrom.

1,994,031. ARTIFICIAL REFRIGERATION. Daniel Thew Wright, Washington, D. C. Application May 16, 1933. Serial No. 671,382. 1 Claim. (Cl. 62—119.5.)

In a refrigerating unit of the character embracing a condensing coil and an absorber for the refrigerant, a closed water circulating system adapted to be interposed between the water supply main and the sewer including a water coil surrounding the absorber and a water coil in juxtaposition to the condensing coil, the water in said water coil being normally trapped against flow when the source of supply is shut off, a valve for shutting off the system from the supply main, a discharge pipe connecting the system to the sewer, a second valve controlled drain pipe connecting a low point in the system to the sewer and an air vent cock for admitting air to the system to displace the water therein when the system is shut off from said supply main and said valve controlled drain pipe is opened.

1,994,037. EVAPORATOR SYSTEM FOR REFRIGERATION. Norman H. Gay, Los Angeles, Calif. Application Nov. 15, 1932. Serial No. 642,802. 29 Claims. (Cl. 62—126.)

1. In a refrigerating system, an evaporator including a plurality of successively superimposed runs each arranged sub-

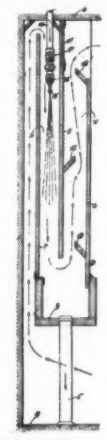


1,994,037

stantially horizontally and connected in series for the free flow of liquid refrigerant downwardly from one run to the other, an upright gas collector pipe, and a plurality of gas outlets connected to runs at different levels and to said gas collector pipe.

1,994,078. REFRIGERATING SYSTEM. Emil Sieloff, St. Louis, Mo., assignor to Sieloff Packing Co., St. Louis, Mo., a corporation of Missouri. Application Feb. 11, 1933. Serial No. 656, 230. 1 Claim. (Cl. 261—116.)

In a cooling chamber having a side wall and a ceiling wall; a refrigerating unit comprising a rectangular box having



1,994,078

a vertical back wall adjacent to and spaced from said side wall and having its upper edge spaced below said ceiling wall, a vertical front wall at a distance from said back wall and having its upper edge spaced below said ceiling wall, a bottom wall connecting the lower edges of said back and front walls, an intermediate wall extending downwardly from said ceiling wall between and spaced from said back and front walls and having lower edge above said bottom wall, baffle walls in connection with said front wall extending upwardly toward said intermediate wall, a baffle in connection with said intermediate wall extending upwardly toward said front wall, a spray nozzle manifold between said back and intermediate walls and below the upper end of said back wall, and a series of spaced nozzles extending downwardly from said manifold.

1,994,080. REFRIGERATION Hugo M. Ullstrand, Evansville, Ind., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application July 25, 1933. Serial No. 682,043. 24 Claims. (Cl. 62—119.5.)

5. In an absorption refrigeration system, a generator, a condenser, an evaporator, and an absorber interconnected to form a circuit for refrigerant fluid, and means exclusive of said circuit providing a vaporization-condensation cycle for cooling said absorber, adapted to contain refrigerant fluid and having a pressure equalizing connection with said refrigerant fluid circuit.

6. In an absorption refrigeration system, a generator, a condenser, an evaporator and an absorber interconnected to form a circuit for refrigerant fluid, means exclusive of said circuit and providing a vaporization-condensation cycle for cooling said absorber, a pressure equalizing connection from said cycle to said refrigerant fluid circuit, and means for supplying liquid refrigerant to said cycle upon increase in temperature of said absorber.

1,994,130. AIR HEATING AND HUMIDIFYING APPARATUS. Charles W. Good, Harry G. Naylor, and Thomas J. Regan, Erie, Pa., assignors to Weil-McLain Co., Michigan City, Ind., a corporation of Delaware. Application Dec. 15, 1933. Serial No. 702,444. 18 Claims. (Cl. 257—138.)

5. A heating apparatus of the character described for installation in a wall recess comprising: exposed front radiating heating means for grille formation; convection heating means; humidifying means, said convection and humidifying means both being disposed adjacent to and on the unexposed side of said radiating means, the latter being adapted in conjunction with the wall of the recess to provide a flue passage for currents of air passing upwardly of the convection and humidifying means.

1,994,233. FREEZING MACHINE. William S. Shaw, Boyne City, Mich. Application Oct. 15, 1930. Serial No. 488,817. 4 Claims. (Cl. 62—104.)

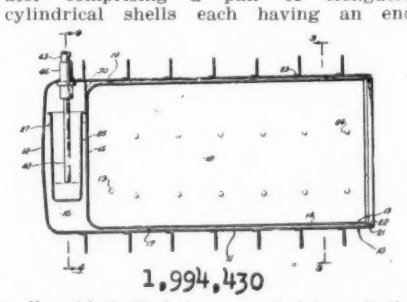
1. A quick freezing machine comprising, in combination, a framework, a plurality of stationary horizontally disposed hollow plates mounted rigidly thereon, a plurality of hollow movable horizontally disposed plates positioned above said stationary plates, means for raising and lowering said movable plates, connections between said lower plates for passing refrigerating fluid therethrough telescoping connections for permitting similar operation with the movable plates, said connection comprising vertically disposed pipes attached to the upper surface of said plates, and vertical pipes telescoping into the latter, said second set of pipes being interconnected by returnbends that are supported on said framework.

1,994,329. AIR CONDITIONING APPARATUS. Frederick White, deceased, late of Newton, Mass., by Lena A. White, executrix, Newton, Mass. Application Dec. 9, 1933. Serial No. 701,659. 18 Claims. (Cl. 261—90.)

1. In an air-conditioning apparatus having a chamber through which the air is drawn and in which it is conditioned, a water tank beneath the chamber, a perforated cylindrical rotary water distributor extending transversely of and within the chamber, a conduit opening at its lower end adjacent the bottom of the tank and at its upper end into the distributor, a rotary main pump located in the lower end of the conduit, a rotary booster pump at the upper end of the conduit, and means for simultaneously rotating said pumps and distributor to cause the water to be raised through the conduit and continuously discharged from all parts of the distributing area of the distributor to produce a dense, violent rainstorm effect in and throughout the chamber.

1,994,430. REFRIGERATION EVAPORATOR. Joseph D. Lear, Buffalo, N. Y., assignor to Fedders Mfg. Co., Inc., Buffalo, N. Y. Application Jan. 4, 1933. Serial No. 650,110. 6 Claims. (Cl. 62—126.)

1. In a refrigeration system, an evaporator comprising a pair of elongated cylindrical shells each having an end

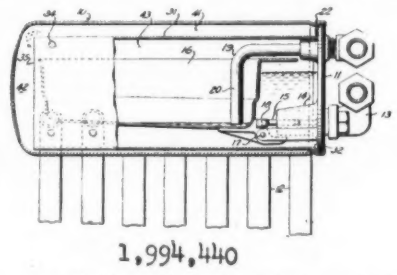


1,994,430

wall, said shells being mounted in radially spaced telescoping relation to form a restricted evaporation space therebetween, the open ends of the cylinders being secured to each other to close said space, the end walls of the shells being axially spaced to provide a narrow float chamber therebetween, a float mounted for pivotal movement transversely of the float chamber, said float having spaced side walls substantially parallel to the end walls of the sleeves to provide restricted evaporation spaces between the float walls and adjacent shell walls, and inlet and outlet conduits entering between the shells, said inlet conduit having a valve connected for operation by said float.

1,994,440. REFRIGERATING DEVICE. Lawrence C. Smith, Kenmore, N. Y., assignor to Fedders Mfg. Co., Inc., Buffalo, N. Y. Application Sept. 24, 1932. Serial No. 634,715. 5 Claims. (Cl. 62—126.)

3. An evaporator comprising a header, a plurality of tubes depending from said header and having their open ends in

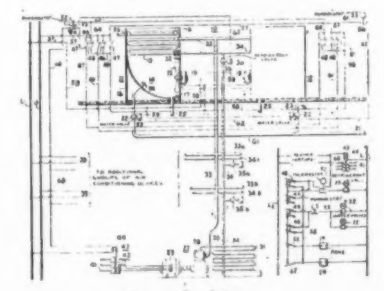


1,994,440

communication with the interior of the header, a float chamber within the header, a manifold in the header for receiving the output of the tubes, said manifold extending in angular relation to said tubes and having an end portion communicating with said float chamber, and refrigerant input and suction conduits communicating with said header.

1,994,441. CONTROL MECHANISM. Lewis R. Smith and William A. Minkler, Pittsburgh, Pa., assignors to Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., a corporation of Pennsylvania. Application Feb. 15, 1934. Serial No. 711,324. 9 Claims. (Cl. 236—44.)

1. In a control system for air conditioning apparatus, the combination of a plurality of groups of air cooling devices,



1,994,441

a refrigerating machine for providing a supply of refrigerant for the devices, a plurality of electrically-operated valves, for respectively controlling the flow of refrigerant from said refrigerating machine to the groups of devices, switches associated with each device for controlling the operation of said refrigerating machine, and connections between the switches of each device in a group and the valve associated with the group for effecting control of the latter by any of the former.

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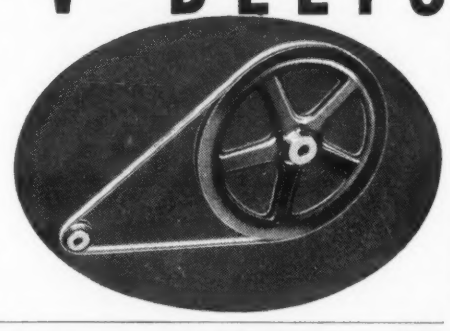

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QUESTIONS

Parts Manufacturers

No. 2138 (Dealer, Minnesota)—"We are very anxious to get hold of a list of manufacturers pertaining to refrigeration parts and service material. Is this information contained in your REFRIGERATION DIRECTORY, and if not do you know where such a list could be obtained?

"We have subscribed for the REFRIGERATION DIRECTORY and would like to know when delivery of this book can be expected."

Answer: The 1935 REFRIGERATION DIRECTORY will contain lists of manufacturers of refrigeration and air-conditioning equipment, component parts and materials and supplies. There will also be a special service section containing a large list of independent service organizations and also a list of companies supplying replacement parts and supplies for refrigerators as well as other non-manufacturing groups supplying specific services to the refrigeration industry.

We expect to have the REFRIGERATION DIRECTORY ready for distribution in about a week or 10 days.

Electrical Pasteurizers

No. 2139 (Distributor, Massachusetts)—"Can you give us any information on an electrically heated pasteurizer for dairy use?"

Answer: For information concerning electrically heated pasteurizers for dairy use, we suggest that you communicate with the following large manufacturers of dairy equipment, who should be able to supply your needs:

Cherry-Burrell, Inc.
427 W. Randolph St., Chicago, Ill.

Chester Dairy Supply Co.
Ninth & Hyatt St., Chester, Pa.

Creamery Package Mfg. Co.
1243 W. Washington Blvd., Chicago, Ill.

Jensen Creamery Machinery Co., Inc.
Nelson St. & Locust Ave., Bloomfield, N. J.

Accessories

No. 2140 (Finance Company, Missouri)—"We would appreciate your sending us a list of firms supplying electrical refrigerator accessories, such as deodorizers, porcelain ware, metal ware, glass ware, etc.

"Do you have any ideas about the advantages or otherwise of supplying such equipment with the sale of refrigerators?

"We have always done so, but would like to get away from it."

Answer: Pages 278, 279, and 280 of the 1934 REFRIGERATION DIRECTORY AND MARKET DATA BOOK list manufacturers of refrigerator accessories including refrigerator dishes and baskets. This list has been brought up to date for the 1935 REFRIGERATION DIRECTORY which will be available for distribution within a short time.

In the 1935 household electric refrigerator models announced by various manufacturers, there seems to be an increased tendency to include a variety of food drawers, baskets, and accessory dishes. The various special features included in the 1935 models of manufacturers are summarized in the March 20 issue of ELECTRIC REFRIGERATION NEWS which includes specifications of 281 models of household electric refrigerators.

Installation Service

No. 2141 (Manufacturer, Ohio)—"Have you information on good dependable installation and service organizations throughout the country capable of handling mechanical refrigeration installations as required for our commercial refrigerators?"

Answer: A list of refrigeration service organizations located in all parts of the United States will be included in the 1935 REFRIGERATION MARKET DATA BOOK which will be available for distribution within a very short time. We believe the list to be included in the 1935 DIRECTORY will be the most complete of its kind ever compiled.

Profit & Loss Figures

No. 2142 (Supply Co., Oklahoma)—"Is it possible for you to supply us with a statistical statement showing the average profit and loss made by refrigeration dealers throughout the country in towns of 10,000 to 200,000 population?"

Answer: The Dun and Bradstreet report, which was published in the statistical section of the March 6 issue of ELECTRIC REFRIGERATION NEWS, gives an analysis of the operating averages of dealers.

G-E 'Minute Man'

No. 2143 (Dry goods store, Minnesota)—"What information can you give us regarding the General Electric "Minute Man" as advertised in your paper of October 24?

"Won't you please give us any information you have as to price, where same can be obtained, etc.?"

Answer: The General Electric Minute Man Delivery Car is made by the Gabriel Co., 1407 East 40th St., Cleveland, Ohio. By writing them direct you can obtain detailed information.

Non-Electric Refrigerators

No. 2144 (Dealer, Minnesota)—"Please send us the names of manufacturers of household refrigerators suitable for summer homes where electric power is not available."

Answer: Manufacturers of non-electric household refrigerators are as follows:

Crosley Radio Corp.
Arlington St., Cincinnati, Ohio.
(Icy-Ball type.)

Gibson Electric Refrigerator Corp.
Greenville, Mich. (Kerosene burning.)

Perfection Stove Co.
7609 Platt Ave., Cleveland, Ohio.
(Kerosene burning.)

Servel, Inc.
Electrolux Refrigerator Sales Div.
Evansville, Ind.
(Both gas and kerosene burning.)

Waukesha Motor Co.
Waukesha, Wis.
(Gasoline engine powered.)

Defrost-O-Clock

No. 2145 (Jeweler, New York)—"Can you advise us the name of the makers of the Bryant Defrost-O-Clock. This is a clock that shuts off the refrigerator and turns it on again once every 24 hours."

Answer: The Bryant Defrost-O-Clock was formerly manufactured by Bryant Electric Co., 844 W. Adams St., Chicago, Ill. The production of this item has been discontinued and the clocks can no longer be supplied.

The Bryant Electric Co. suggests that clocks of similar design might possibly be obtained from Westinghouse-New Haven Clock Co., New Haven, Conn., or Sparks-Withington Co., Jackson, Mich.

Water Cooler Cabinets

No. 2146 (Water supply company, Pennsylvania)—"We are assembling electric water coolers and are in the immediate market for about 100 bottle type and pressure type cabinets.

"We have contacted all the manufacturers listed in your DIRECTORY, but they seem to have discontinued this line.

"Do you know where we can pick up this item from stock for immediate shipment?"

Answer: We suggest that you communicate with the following companies for bottle and pressure type water-cooler cabinets:

Cordley & Hayes
145 Hudson St., New York, N. Y.

Filtrine Mfg. Co.
53 Lexington Ave., Buffalo, N. Y.

Temprite Products Corp.
1349 Milwaukee Ave., Detroit, Mich.

S & S Mfg. Co.
Lima, Ohio.

Isobutane

No. 2147 (Reader, Pennsylvania)—"Kindly advise me through your Question and Answer Column where I can obtain Isobutane at a reasonable price. I have seen an ad for this gas in your classified columns, but I have mislaid this copy and have noticed this firm has not advertised since."

Answer: See first classified advertisement in adjoining column for source of supply and prices.

No. 2148 (Dealer, Illinois)—"We are interested in purchasing Isobutane refrigeration gas for resale to service men. If you can supply us with names of manufacturers from whom we can purchase this gas, kindly advise us."

Answer: See above.

Truck Refrigeration

No. 2149 (Reader, New York)—"I am interested in ascertaining what has been done toward developing refrigeration for trucks and other mobile vehicles, and would much appreciate any information you can give me on this subject, or the names of any books or periodicals to which I could refer."

Answer: On the "Personalities" page of the January 30, 1935 issue of ELECTRIC REFRIGERATION NEWS is a brief summary of the most important events in truck refrigeration during 1934. More detailed accounts of developments in truck refrigeration made by various manufacturers were published in ELECTRIC REFRIGERATION NEWS in the following issues: Feb. 21, 1934, and Oct. 3, 1934, the McCord Petrogas system for cooling trucks; Sept. 19, 1934, Louis Allis Co. "Dynamatic" drive adapted for refrigerated trucks; Oct. 17, page 4, Kold-Hold forced-convection cooling system for trucks; Oct. 17, page 6, Kelvinator's four condensing units for trucks; Oct. 24, 1934, Refrigerated trucks at Cleveland Dairy Show; Nov. 14, 1934, page 9, General Electric's power take-off drive and heat exchanger; Nov. 28, 1934, Century Electric Co. to market Whitaker-Upp units.

Air Conditioning Survey

No. 2150 (Ice Company, New York)—"During the fall of 1934 or January, 1935, the writer recalls seeing an itemized list of air-conditioning jobs sold in Kansas City.

"We would greatly appreciate securing a copy of this issue if one is available."

Answer: Results of the nation-wide air-conditioning survey made by ELECTRIC REFRIGERATION NEWS have been published for principal cities of the United States as follows:

Kansas City and Detroit, Dec. 26, 1934; Chicago, Feb. 6, 1935; Houston, Feb. 20, 1935; New York City, Boston, and Philadelphia, Feb. 27, 1935; Louisville, March 6, 1935; St. Louis, March 13, 1935; and Cincinnati, March 20, 1935.

No. 2151 (Manufacturer, Chicago)—"We would like to have a copy of the issue which carried a list of the air conditioning installations in Kansas City, Missouri, which was in one of your recent issues.

"If you have any other recent listings relative to installations made in any of the principal cities during 1933 or '34, would also appreciate having them."

Answer: See above.

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